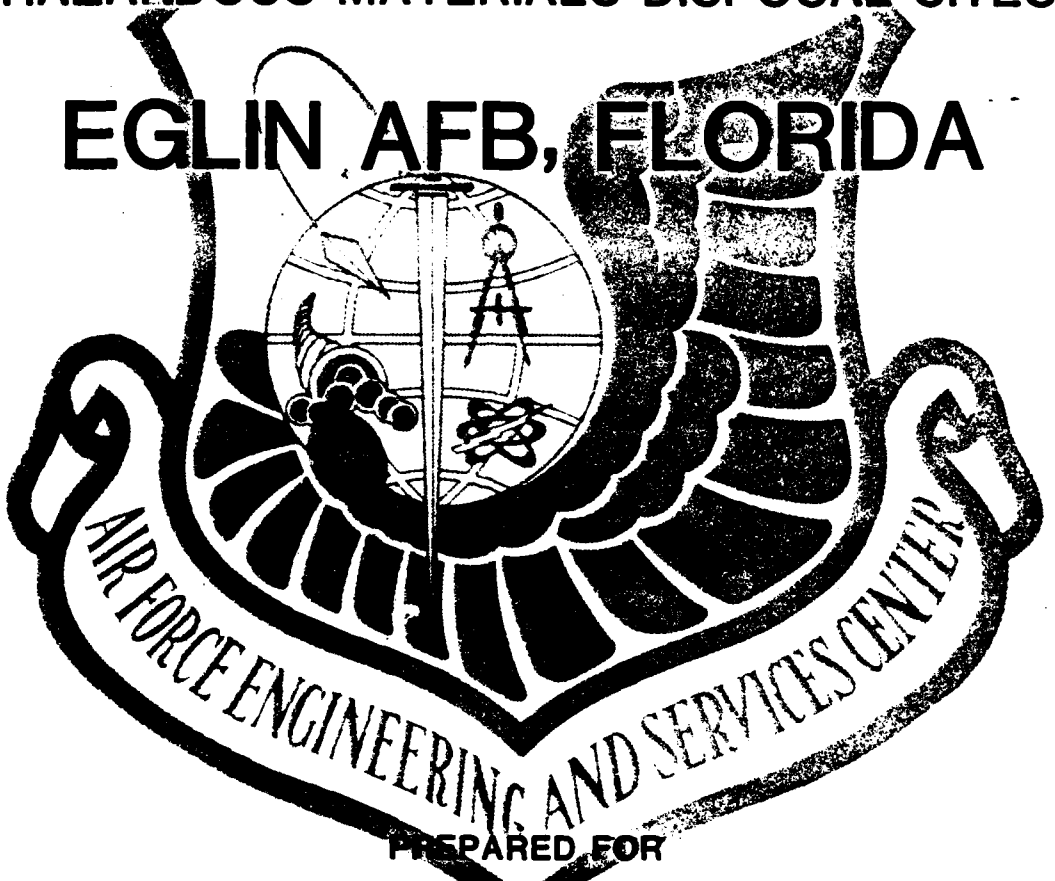
INSTALLATION RESTORATION PROGRAM

PHASE I—RECORDS SEARCH, HAZARDOUS MATERIALS DISPOSAL SITES

EGLIN AFB, FLORIDA



PREPARED FOR

UNITED STATES AIR FORCE
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This report summarizes the Installation Restoration Program (IRP) Phase I study results at Eglin AFB, FL. The effort determines if there may exist hazardous waste site on-site via a records search and personnel interviews. Thirty potential sites ~~identified~~ were identified. This effort will be followed by IRP Phase II in which field data will be collected to verify and define the sites.

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INSTALLATION RESTORATION PROGRAM
PHASE I: EGLIN AFB

Prepared For
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Tyndall AFB, Florida

October, 1981

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This report has been prepared for the US Air Force by Engineering-Science for the purpose of aiding in the implementation of Air Force Solid Waste Management Programs. It is not an endorsement of any product. The views expressed herein are those of the contractor and do not necessarily reflect the official views of the publishing agency, the United States Air Force or the Department of Defense.

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Engineering-Science, Inc. (ES) gratefully acknowledges the efforts and valuable assistance provided by U.S. Air Force personnel (both military and civilian) during the course of this project. The willing cooperation, guidance and assistance provided by Lt. Col. Edward L. Hubbard, IRP Point of Contact and Mr. Bernard Lindenberg, P.E., IRP Project Officer is especially appreciated. Numerous other Air Force personnel including Mr. Paul Cadenhead, Mr. Rick Crews, Mr. Don Harrison, Major Hartman, Major Shingler, Dr. Harry Wolfgang and their staffs are also thanked for their contributions. The project manager would also like to acknowledge and thank the ES project team for their hard work and thoroughness. This team includes:

John Absalon, CPG - Hydrogeologist
B.D. Moreth - Biologist
E.F. Palmer - Chemist/Environmental Engineer
R.M. Reynolds - Chemical Engineer

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The Department of Defense (DOD) has established the initial phase of a comprehensive program to assess and control the migration of environmental contamination that may have resulted from past operations and disposal activities at DOD facilities. A program known as the Installation Restoration Program (IRP) has been developed as a three phase program:

Phase I - Problem Identification/Records Search

Phase II - Problem Confirmation and Quantification

Phase III - Corrective Action

Engineering-Science (ES) was contracted to conduct Phase I of the IRP for Eglin Air Force Base (AFB).

The on-site portion of Phase I was performed at Eglin AFB April 6 - April 10, 1981 and July 20 - July 24, 1981. During these periods formal interviews were conducted with key base personnel familiar with past waste disposal practices, file searches were performed for identified facilities which have generated, handled, transported, and disposed of waste materials, and site inspections were conducted.

INSTALLATION DESCRIPTION

The Eglin Air Force Base Complex is located in the Northwest Florida Panhandle, approximately midway between Pensacola and Panama City. The main base is located approximately six miles north of Fort Walton Beach. Eglin occupies more than 720 square miles of land ranges and facilities and more than 44,000 square miles of test area in the Gulf of Mexico including a portion of Santa Rosa Island in Escambia County, the southeastern part of Santa Rosa County, the southern half of Okaloosa County, and the southwestern quarter of Walton County. The Reservation is bounded on the south by Choctawhatchee Bay and the Gulf of Mexico, while to the north and east it is bordered roughly by the Yellow River and Alaqua Creek. To the west, the Reservation is bordered by East Bay and Blackwater Bay adjacent to Escambia Bay.

ENVIRONMENTALLY SENSITIVE CONDITIONS

Several environmentally sensitive conditions are present at Eglin Air Force Base which need to be considered when evaluating past handling and disposal of hazardous waste materials.

1. The base is located within what must be regarded as a ground-water recharge zone for the upper sand and gravel aquifer. The topography and regional soils favor rapid infiltration rates. It is reasonable to expect pollutants mobilized by precipitation to ultimately percolate downward into this sand and gravel aquifer. Discharge of the sand and gravel aquifer occurs to local springs and streams along the installation boundary and to the Gulf.
2. Primary drinking water is taken from the underlying Upper Floridan Aquifer which is physically separated from the overlying upper sand and gravel aquifer by the Pensacola clay layer. The Upper Floridan Aquifer is recharged in outcrop areas North of the Eglin Reservation.
3. Wetlands are located on the base; however, not all have been identified concerning their size, location and functional value.
4. Shallow wells are vulnerable to contamination originating from various Eglin AFB activities. Normally shallow water wells are not used for drinking water purposes.
5. Ecological areas such as preserved natural features, unique habitats and areas inhabited by endangered or sensitive species could be disrupted by contamination. Endangered or threatened species at Eglin include the Okaloosa darter, red-cockaded woodpecker, American alligator, southern bald eagle, peregrine falcon, indigo snake, brown pelican, and the pine barrens treefrog. No documented disruptions of the area's ecological characteristics due to waste disposal practices have occurred.

PROCEDURES

A review of all waste generation sources at the base was conducted to determine past disposal methods for hazardous wastes. This review included industrial shop areas, pesticide and herbicide utilization, test ranges, fire control training areas, hazardous waste storage areas and POL (Fuels Management) areas. Past and recent waste materials were

identified for all of these. The disposal methods used for each waste source were determined according to base records, interviews, and on-site visits. The types of sites visited included: landfills, oil-water separators, sanitary sewers, waste treatment plants, storm sewers, septic tanks, and waste treatment plant spray irrigation areas.

FINDINGS AND CONCLUSIONS

Based on the results of the project team's two, one-week field inspections, review of records and files, and interviews with base personnel, thirty sites located on the Eglin AFB property were identified as containing hazardous material resulting from past waste disposal activities and have potential for contaminant migration. These sites have been assessed using a rating system which takes into account factors such as site characteristics, waste characteristics, potential for contamination and waste management practices. The details of the rating procedure are presented in Appendices G and H and the results of the assessment are illustrated in Table 1. Rating scores were developed for the individual sites and the sites are listed in order of ranking. The rating system is designed to indicate the relative need for more detailed site assessment and/or remedial action.

The following key conclusions have been developed:

1. Eglin Main Base Landfill (Site D1), operated during the 1940's to 1960's, presents the greatest potential for off-site migration of contaminants due to the following:
   a. Size: about 100 acres
   b. Nature of wastes disposed: waste oils, waste solvents, waste treatment sludges, PCB capacitors, partially empty pesticide containers, general refuse, hardfill
   c. Location: located in sandy soils of the upper sand and gravel aquifer with a high water table, and in close proximity to the installation boundary and drinking water wells which tap the Floridan Aquifer.
2. Eglin Main Base Landfill (Site D2), operated during the early 1960's to 1973, also presents a high potential for off-site migration of contaminants.

TABLE 1

PRIORITY RANKING OF POTENTIAL CONTAMINATION SOURCES

EGLIN AFB

Rank	Site Number	Site Name	UTM Coordinates	Overall % Assumed	Overall Score
1	D1	Eglin Main Landfill (1940's - 1960's)	EJ 549350 3370600	16	79
2	D2	Eglin Main Landfill (1960's - 1973)	EJ 545400 3369900	10	76
3	D26	Hurlburt Field Sanitary Landfill (closed 1979)	EJ 526600 3365700	0	65
4	D3	Eglin Main Landfill (1973 - 1978)	EJ 548000 3370700	12	65
5	D41	Hurlburt Field E.O.D. Disposal Site	EJ 526400 3365800	4	65
6	D40	A-11A Disposal Site	EJ 527480 3362300	16	64
7	D7	Receiver Area Landfill	EJ 547320 3373830	16	62
8	T3	Hardstand 7	EJ 546180 3372820	0	59
9	T1	Herbicide Test Grid	EJ 566370 3376035	0	59
10	D4	Disposal Pit Near Skeet Range	EJ 549450 3370800	8	59
11	D18	Valparaiso/Niceville Landfill	EJ 547260 3379450	4	58
12	D9	Mullet Creek Disposal Site	EJ 565050 3376510	16	57
13	S2	DPDO Storage Yard	EJ 546080 3371500	4	57
14	D15	Field No. 2 North Landfill	EJ 553330 3383640	16	57
15	D5	A-19 Drum Disposal Site	EJ 547510 3373430	16	57
16	D17	Field No. 2 Drum Disposal Site	EJ 553350 3381670	8	54
17	S3	CE Storage Yard	EJ 548700 3371430	8	54
18	IS4	Welding/Electroplating Shop	EJ 546700 3371200	8	54
19	IS3	Paint Shop	EJ 546700 3371200	8	54
20	D30	Hurlburt Field Sanitary Landfill	EJ 528040 3365730	8	53
21	D29	Hurlburt Field Sanitary Landfill	EJ 528400 3365800	8	53
22	D37	Wright Landfill	EJ 535940 3370730	4	52
23	IS1	Missile Maintenance	EJ 544875 3373900	8	52
24	D31	Hurlburt Field Landfill	EJ 528180 3365600	3	51
25	D32	Hurlburt Field Dry Landfill	EJ 528800 3365700	3	51
26	IS6	Hurlburt Field Allied Trades Paint Booth	EJ 529140 3364800	3	50
27	IS2	Electric Shop	EJ 546950 3371500	0	49
28	D34	Hurlburt Field Sanitary Landfill	EJ 529100 3366200	12	44
29	D35	Hurlburt Field Sanitary Landfill	EJ 529480 3364585	3	44
30	D33	Hurlburt Field Sanitary Landfill	EJ 529000 3366380	12	44

NOTE: This Priority Ranking was performed according to the Hazard Evaluation Methodology described in Appendix G. Site Waste Rating Forms - in order of ranking - are presented in Appendix H.

3. Hurlburt Field Sanitary Landfill (Site D26), Eglin Main Landfill (1973-1978) (Site D3), Eglin Receiver Area Landfill (Site D7), Hurlburt Field E.O.D. Disposal Site (Site D41) and the A-11A Disposal Site (Site D40) are the next key disposal areas with potential for off-site migration of contaminants. All of these sites have been closed.

   a. Hurlburt Sanitary Landfill (1972-1979) (Site D26) and Eglin Main Landfill (1973-78) (Site D3) wastes are similar in nature and both sites are located in sandy soil areas. Visual evidence of leaching exists in areas of the Site D26 landfill. Wastes were filled below the water table level during the site's operation. This site should rank higher priority than Site D3 since wastes from D3 were not filled below the water table level and no contaminant leaching is visually evident.

   b. Hurlburt Field E.O.D. Disposal Site (Site D41) generates seepage which discharges to East Bay Swamp. Unexploded ammunition and non-ignited napalm are the waste sources which present a ground-water contamination potential.

   c. A-11A disposal site (Site D40) is located in extremely sandy soil conditions in close proximity to Santa Rosa Sound.

RECOMMENDATIONS

The following recommendations for Phase II are made to further assess or prevent potential contaminant migration from waste disposal sites at Eglin AFB. The recommendations are grouped into two areas, first priority and second priority:

First Priority

1. It is recommended that a ground-water monitoring program be established at each of the following sites to determine whether there is any contamination:

   - Eglin Main Landfill (1940's-1960's) - Site D1
   - Eglin Main Landfill (1960's-1973) - Site D2
   - Hurlburt Field Sanitary Landfill (1972-1979) - Site D26
   - Eglin Main Landfill (1973-1978) - Site D3
   - Hurlburt Field E.O.D. Disposal Site - Site D41.

Such a monitoring system should consist of at least one monitoring well located hydraulically up-gradient of each site, and three monitoring wells located hydraulically down-gradient of each site. At this time, it is believed that wells comprising such a system will have a total depth on the order of thirty to thirty-five (30-35) feet. The actual design of a ground-water quality monitoring system must be predicated upon site-specific hydrogeological data. At a minimum, the following parameters should be monitored: chloride, iron, manganese, phenol, sodium, sulfate, pH, specific conductance, total organic halogen and total organic carbon.

2. Grab samples of the surface seepage originating at the Hurlburt Field E.O.D. Disposal Site (D41) should be collected to characterize seepage. The leachate on Hurlburt Field sanitary landfill (Site D26) should also be sampled and characterized. At a minimum, these samples should be analyzed for the following parameters: chloride, phenol, iron, manganese, sulfate, pH, specific conductance, total organic halogen and total organic carbon.

Second Priority

It is recommended that ground water and any surface water leachate sampling be performed at the following sites with similar analyses being carried out as outlined above:

- A-11A Disposal Site (D40)
- Eglin Receiver Area Disposal Site (D7)

SECTION 1

INTRODUCTION

SECTION 1
INTRODUCTION

AUTHORITY

Simultaneous with the passage of RCRA, the Department of Defense (DOD) devised a comprehensive Installation Restoration Program (IRP). The purpose of the IRP is to provide DOD policy for the initial phase of a comprehensive program to assess and control the migration of environmental contamination that may have resulted from past operations and disposal activities at DOD facilities.

PURPOSE AND SCOPE OF THE ASSESSMENT

The Installation Restoration Program has been developed as a three-phase program as follows:

Phase I - Problem Identification/Records Search
Phase II - Problem Confirmation and Quantification
Phase III - Corrective Action

The Problem Identification/Records Search phase (Phase I) is directed towards providing answers to the following questions:

1. What hazardous materials have been generated on the reservation?
2. How have the wastes been managed?
3. Was the waste management procedure adequate to immobilize, contain, treat, destroy or detoxify the waste material?
4. By what routes or means (if any) can the wastes migrate off the reservation?
5. What effects could occur (or might have occurred) through the discharge or release of the wastes?

The purpose of this report is to summarize and evaluate the information collected during Phase I of the IRP.

Future Phase II and Phase III efforts will be directed towards:

1) Actions necessary to confirm the existence and extent of an identified potential contamination problem (Phase II)
2) Corrective measures as necessary to remedy the problem (Phase III).

Phase I Project Description

The goal of the first phase of the program was to identify the potential for environmental contamination from past waste disposal practices at Eglin AFB, and to assess the probability of contaminant migration beyond the installation boundary. Eglin Auxiliary Field #10 (Dillon Field) was excluded from the study area for the Eglin AFB Installation Restoration Program. The activities undertaken by Engineering-Science (ES) in Phase I included the following:

- Review site records
- Interview key personnel familiar with past generation and disposal
- Inventory wastes
- Determine quantities and locations of past hazardous waste storage, treatment and disposal
- Evaluate disposal practices and methods
- Determine adequacy of storage, treatment and disposal facilities
- Gather pertinent information from federal, state and local agencies
- Evaluate compliance with federal, state and local regulations
- Assess potential for contamination
- Preliminary evaluation of extent of potential contamination
- Determine potential for materials to migrate off site
- Conduct field inspection

In order to perform the on-site portion of the Records Search phase, ES assembled the following core team of professionals whose professional qualifications are presented in Appendix A:

- W. G. Christopher, Environmental Engineer and Project Manager, ME, 6 years of professional experience
- J. R. Absalon, Hydrogeologist, BS Geology, 8 years of professional experience

- R. M. Reynolds, Chemical Engineer, BSChE, 8 years of professional experience
- B. D. Moreth, Biologist, BS in Zoology and BS in Forest Science, 10 years of professional experience
- E. F. Palmer, Chemist and Environmental Engineer, MS, 4 years of professional experience

The on-site portion of the Records Search phase was performed at Eglin AFB April 6 through April 10, 1981. During this period formal interviews were conducted with 65 key base personnel representing 13 organizations. File searches were conducted within 12 key organizations which generate, handle, transport, and dispose of waste materials. A follow-up visit to Eglin AFB was made July 20-24, 1981 to gather additional information to complete the assessment. During the two on-site periods site visits and field reconnaissance were conducted at all identified facilities that treated, stored or disposed of hazardous materials. These facilities include landfills, waste treatment facilities, material storage areas, laboratories, industrial shops and other support facilities. The information collected during this intensive records search is summarized and evaluated in subsequent sections of this report.

SECTION 2

INSTALLATION DESCRIPTION

SECTION 2

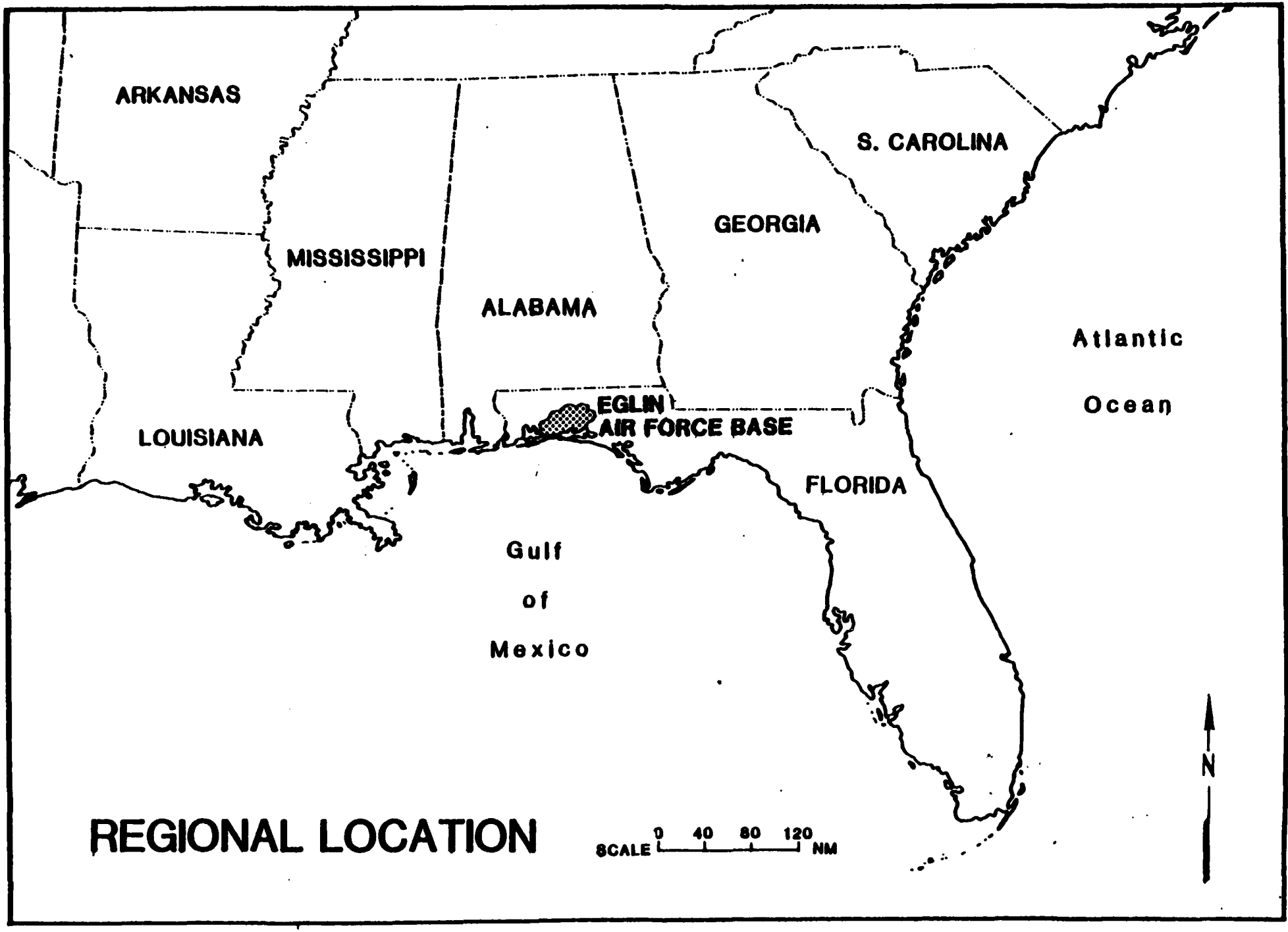
INSTALLATION DESCRIPTION

GENERAL

Eglin Air Force Base, located in Northwest Florida (Figure 2.1), is one of the largest Air Force Bases in the free world. The base area comprises more than 720 square miles of land ranges and facilities and more than 44,000 square miles of test area in the Gulf of Mexico. The land complex alone measures 51 miles long and 19 miles wide. The base was founded in 1935, and was originally called the Valpairiso Bombing and Gunnery Range. A brief installation history is presented in Appendix B.

LOCATION, SIZE AND BOUNDARIES

The Eglin Air Force Base Complex is located in the Northwest Florida Panhandle, approximately midway between Pensacola and Panama City. The main base is located approximately six miles north of Fort Walton Beach. Eglin occupies a portion of Santa Rosa Island in Escambia County, the southeastern part of Santa Rosa County, the southern half of Okaloosa County, and the southwestern quarter of Walton County. The Reservation is bounded on the south by Choctawhatchee Bay and the Gulf of Mexico, while to the north and east it is bordered roughly by the Yellow River and Alaqua Creek. To the west, the Reservation is bordered by East Bay and Blackwater Bay adjacent to Escambia Bay. The Reservation location is shown in relationship to adjacent boundaries, towns and physical features in Figure 2.2. Also included on this map are the approximate local population estimates.



REGIONAL LOCATION

FIGURE 2.1

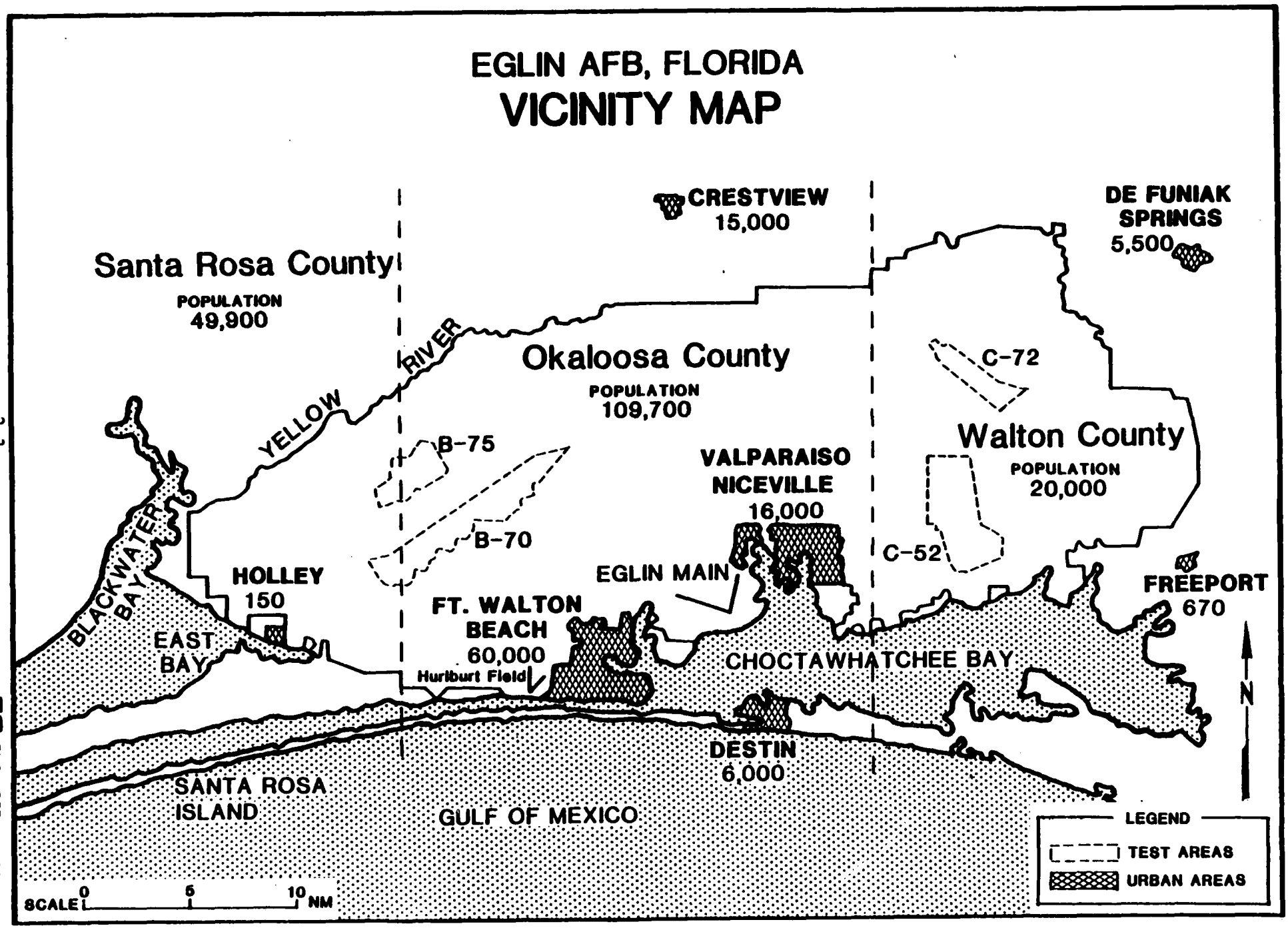


FIGURE 2.2

ES ENGINEERING - SCIENCE

Of the approximately 464,000 acres, approximately 0.3% (1400 acres) is improved area, 0.9% (4200 acres) is semi-improved and 98.8% is unimproved.

ORGANIZATION AND MISSION

Eglin AFB is the headquarters for Air Force Systems Command's Armament Division (AD). The Division's primary mission is to develop, test, and initially acquire all nonnuclear air armament for the Air Force's tactical and strategic forces. This mission encompasses the entire spectrum of activities, from research technology and development planning to initial acquisition of armament for the Air Force inventory.

AD performs the air armament acquisition process from conceptual planning to initial production of military hardware. This hardware, developed and produced under the management of AD, fulfills non-nuclear operational armament needs of the tactical and strategic arms of the Air Force.

AD is extensively involved in the test and evaluation of air armament. It supplies a broad range of capabilities in this area to carry out test and evaluation of electromagnetic warfare systems, intrusion interdiction systems, and inertial navigation systems, to name a few.

The AD also serves as host to more than 40 tenant units at Eglin. Many of these units are small organizations that serve staff or support functions. The major tenant organizations at Eglin and Hurlburt are listed below:

1st Special Operations Wing (Hurlburt Field)
The 834th Combat Support Group (Hurlburt Field)
33rd Tactical Fighter Wing
Tactical Air Warfare Center (TAWC)
Det 4, 1402 Military Airlift Squadron
919th Special Operations Group (AFRES)
55th Aerospace Rescue & Recovery Squadron
1972nd Communications Squadron
Army/Air Force Exchange Service (AAFES)
Federal Prison

728th Tactical Control Squadron

US Army Rangers

20th Missile Warning Squadron

39th Aerospace Rescue and Recovery Wing

SECTION 3

ENVIRONMENTAL SETTING

SECTION 3

ENVIRONMENTAL SETTING

The environmental setting of the Eglin AFB is described in this section with the primary emphasis directed toward identifying features which could transport hazardous waste contaminants off the base. Additional detail information concerning the environmental setting and biological resources baseline is presented in Appendix C.

METEOROLOGY

Eglin Air Force base receives a high average rainfall of 60 inches annually. Mean lake evaporation is 48 inches per year. Mean temperatures vary from 51.5°F to 81.8°F. Table 3.1 illustrates a summary of meteorological data.

GEOGRAPHY AND TOPOGRAPHY

Eglin Air Force Base straddles three major physiographic regions of Northwest Florida: the Western Highlands, the Gulf Coastal Lowlands and the Gulf Island Barrier Chain. The Highlands consist of gently rolling hills with a typical elevation of 200 feet MSL. The Coastal Lowlands are a broad expanse exhibiting little relief, with an average elevation of 60 feet MSL, while the Barrier Chain dunes and beach ridges typically average 10 feet MSL.

Drainage

The installation occupies portions of two major drainage basins: the Yellow River Basin which drains the northern section of the base and the coastal Area Basin, which drains the Southern base area. Swamps have developed along the water courses of many streams due to flat local

TABLE 3.1

VARIOUS WEATHER CONDITIONS AT EGLIN AFB, FL

Month	Mean Temp	Mean Max. Temp	Mean Min. Temp	Mean Precip	Max Precip	Mean Wind Spread	Most Freq. Direction
January	51.5	60.8	42.0	3.95	9.74	6.7	N
February	54.0	63.3	44.3	4.26	12.68	7.0	N
March	59.2	68.3	49.7	5.98	14.40	7.3	N, ESE
April	67.1	76.0	58.0	4.50	12.09	7.0	S
May	74.1	83.2	64.6	3.37	7.99	6.4	S,SSW,SW
June	79.9	88.0	71.4	5.23	12.27	5.8	SW,SSW
July	81.6	89.2	73.7	7.19	19.88	5.3	SW,SSW,S
August	81.8	89.7	73.5	7.12	14.18	5.2	S, SW
September	78.3	86.5	69.9	6.75	23.27	5.9	NE, N
October	69.6	79.8	59.2	2.31	14.97	5.8	N, NE
November	58.9	69.3	48.2	3.44	11.93	6.1	N
December	53.4	62.5	43.6	4.98	16.64	6.3	N

Note: This information comes from the Revised Uniform Summary of Surface Weather Observations for Eglin AFB, FL. Data furnished by Det 10, 2 ws, Eglin AFB, FL.

topography and sediment accumulation. Area stream flow tends to be fairly consistent annually, as local soils favor low runoff rates and high infiltration rates that tend to equalize base flow to streams. In addition, local drainage basins are known to store large quantities of water. Flooding is not normally a significant hazard for the base area.

Soils

Most surface soils of the installation tend to be acidic, deep sandy soils that are well-drained. A single soil group, confined to swamp areas, consists of organic clays over sands and is poorly drained.

Geology

The surface geology of Eglin Air Force Base consists of four distinct units: coarse sand and gravel of the Citronelle Formation, clayey sand, sandy clay and clay, and fine to medium sand and silts. The coarse-grained units are typically restricted to upland areas, while finer-grained units are located in lowland zones or stream valleys. Clay beds may be present locally in any of the sandy units. The actual delineation between individual units is vague due to reworking of sediments during repeated changes in sea level stands.

Eglin Air Force Base is located in the Coastal Plain, where geologic units typically consist of unconsolidated materials or sedimentary rocks deposited in a homoclinal wedge thickening seaward. Due to Eglin's position on the flanks of two basins (Gulf Coast Geosyncline and the Mississippi Embayment) geologic units typically exhibit a southwestward dip. Major geologic units, ages, lithologies and stratigraphic relationships are discussed in more detail in Appendix C.

HYDROGEOLOGY

Two significant aquifers have been identified in the Eglin Air Force Base Area: the sand and gravel aquifer and the Floridan Aquifer. The sand and gravel aquifer is composed of sands, gravels and interbedded shell layers of three geologic units. Unit thickness increases westward from a few feet at the Choctawhatchee River to some 1200 feet at Mobile Bay. This aquifer normally functions at atmospheric conditions (unconfined) but may be confined locally. Coarser fractions of the unit are very permeable, permitting recharge by rapid infiltration

and steady base flow to streams. Consumptive use of this unit is typically limited to domestic or irrigation purposes. The bottom of this unit is defined by the Pensacola Clay, which confines the Upper Floridan Aquifer, immediately below.

The Floridan Aquifer (Upper Section) is the primary hydrogeologic unit of Northwest Florida, furnishing potable water supplies to most area consumers. The Floridan underlies most of the state, averaging 1000 feet thick and is composed primarily of limestone and dolomite. The unit functions as an artesian (confined) aquifer. Recharge of this unit occurs north of Eglin AFB where geologic units of this aquifer crop out. In most of the study area, the Floridan is subdivided into Upper and Lower Sections by the Bucatunna Clay. The Lower Floridan, consisting primarily of chalky limestone and other carbonate rocks, is also artesian and receives recharge north of the installation. The Lower Floridan is not used for consumptive purposes due to several natural water quality deficiencies.

Water Quality

The primary regulatory authority legislated purview over water quality maintenance for the Eglin Air Force Base Area is the Florida Department of Environmental Regulation (FDER). The State of Florida, in complying with the Federal Water Pollution Control Act, as amended, has enacted Water Quality Standards, Chapter 17-3 of the Rules of the FDER. These rules set state-wide criteria for the classification, use, testing and protection of all waters. Waters of the State of Florida are classified according to the following schedule, which is based upon potential utilization:

Class	Water Type and Utilization
I-A	Potable water supplies - surface/water
I-B	Potable and agricultural water supplies and storage - groundwater (waters with natural Total Dissolved Solids (TDS) < 10,000 mg/l)
II	Shellfish propagation and harvest - surface waters
III	Recreation, propagation and management of fish and wildlife - surface water
IV	Agricultural water supplies - surface waters

V-A	Navigation, utility and industrial use - surface waters
V-B	Freshwater storage, utility and industrial use - groundwater (waters with natural TDS > 10,000 mg/l).

Waters adjacent to and within the limits of Eglin Air Force Base are classified I-B, II and III. General water quality criteria for Eglin AFB waters are presented as Table 3.2. All installation groundwaters are classified I-B. Stream waters are classified as follows:

Choctawhatchee Bay and Tributaries:	Class II (White to Wheeler Points)
East Bay and Tributaries:	Class II
Blackwater Bay:	Class II
Santa Rosa Sound:	Class II
Yellow River and Tributaries:	Class III

Water quality monitoring of surface and groundwaters at Eglin Air Force Base has been conducted by Air Force personnel in order to comply with state water quality and applicable Air Force regulations. Waste management practices (specified by the Resource Conservation and Recovery Act of 1976, presently administered in Florida by the FDER Solid Waste Management Program) include monitoring requirements in landfill operating permits. In addition to the above, monitoring is required by applicable Air Force Regulations.

Environmental water quality monitoring at Eglin AFB was the subject of a consultative report published by the USAF Occupational and Environmental Health Laboratory (OEHL), Brooks AFB, Texas in December 1977. This report reviewed applicable requirements, existing programs, and presented conclusions based upon general findings. The OEHL report found Eglin AFB water quality was generally acceptable with the exception of "naturally occurring heavy metals, phenols and fecal bacteria" that occasionally exceeded state water quality standards. A study now in progress by the Northwest Florida Water Management District (to be published in 1981) examining surface and groundwater characteristics of South Walton and Okaloosa Counties has tentatively found that with the

TABLE 3.2

WATER QUALITY STANDARDS

State of Florida Rules of the Department of Environmental Regulation Chapter 17-3

Effective March 1, 1979

Parameter	Surface Waters: General Criteria	Class II Surface Waters Shellfish Propagation or Harvesting	Class III Surface Waters Recreation - Propagation and Management of Fish and Wildlife	Class I-G Groundwater Potable and Agricultural Water Supplies & Storage
Alkalinity			Freshwaters ≥ 20 mg/l as $CaCO_3$	
Aluminum		1.5 mg/l	1.5 mg/l	
Ammonia			Freshwaters 0.02 mg/l	
Antimony		0.2 mg/l	Marine Waters 0.2 mg/l	
Arsenic	0.05 mg/l			0.05 mg/l
Barium				1.0 mg/l
Bacteriological Quality		Median Coliform MPN 70/100 Fecal Coliform MPN 14/100	(12)	
Beryllium				
Biochemical Oxygen Demand	(1)		(11)	
Biological Integrity		(6)	(6)	
Bromine and Bromates		Bromine 0.1 mg/l Bromates 100.0 mg/l	Marine Waters Bromine 0.1 mg/l Marine Waters Bromates 100.0 mg/l	
Cadmium		5.0 µg/l	Marine Waters 5.0 µg/l Freshwaters 0.8 µg/l (13)	0.01 mg/l
Chlorides	Marine Waters ≤ 10% Above Background Level			
Chlorine (total residual)		0.01 mg/l	0.01 mg/l	
Chromium	Effluent Discharge 0.5 mg/l Hexavalent 1.0 mg/l Total Receiving Waters 0.05 mg/l total			0.05 mg/l
Copper	0.5 mg/l	0.015 mg/l	Marine Waters 0.015 mg/l Freshwaters 0.03 mg/l	
Cyanide		5.0 µg/l (19)	5.0 µg/l (19)	
Detergents	0.5 mg/l			
Dissolved Gases		<110% of saturation limit	<110% of saturation limit	
Dissolved Oxygen		5.0 mg/l	Freshwaters 5.0 mg/l Marine Waters 5.0 mg/l	
Fluorides	10.0 mg/l as F^-	1.5 mg/l	Marine Waters 5.0 mg/l	1.5 mg/l

Table 3.2 (Continued)

Parameter	Surface Waters: General Criteria	Class II Surface Waters Shellfish Propagation or Harvesting	Class III Surface Waters Recreation - Propagation and Management of Fish and Wildlife	Class I-II Groundwater Potable and Agricultural Water Supplies & Storage
Iron		0.3 mg/l	Freshwaters 1.0 mg/l Marine Waters 0.3 mg/l	
Lead	0.05 mg/l		0.03 mg/l	0.05 mg/l
Manganese		0.1 mg/l		
Mercury		0.1 µg/l	Marine Waters 0.1 µg/l Freshwaters 0.2 µg/l	0.002 mg/l
Nickel		0.1 mg/l	0.1 mg/l	
Nitrate				10.0 mg/l as N
Nutrients	(2)	(2)	(2)	
Odor		≤ TON 24 at 60° C		
Oils & Greases	Dissolved or Emulsified oil 5.0 mg/l (17)			
Pesticides & Herbicides		(7)	(9)	(10)
pH	(14)	(15)	(16)	
Phenolic Compounds	Chlorinated Phenols ≤ 1.0 µg/l (3)			
Phosphorus (Elemental)		0.1 µg/l	Marine Waters 0.1 µg/l	
Phthalate Esthers			Freshwaters 3.0 µg/l	
Polychlorinated Biphenyls		0.001 µg/l	0.001 µg/l	
Radioactive Radium 226 and 228 Substances	Radium 226 and 228 ≤ 5 picocuries/l Gross Alpha Beta ≤ 15 picocuries/l			≤ 5 picocuries/l Gross Alpha and Beta ≤ 15 picocuries/l
Selenium		0.025 mg/l	0.025 mg/l	0.01 mg/l
Silver		0.05 µg/l	Freshwaters 0.07 µg/l Marine Waters 0.05 µg/l	0.05 mg/l
Specific Conductance	(4)			
Substances (misc)	(5)			(5)
Transparency		(8)	(8)	
Turbidity	≤ 50 (JU's) above natural background			
Zinc	1.0 mg/l		Freshwaters 0.03 mg/l (18)	

TABLE 3.2 (Continued)

NOTES:

(1) Shall not be increased to exceed values which would cause dissolved oxygen to be depressed below the limit established for each class.
(2) Limited as needed to prevent other standards violations.
(3) Unless higher values are shown not to be chronically toxic. Chlorinated phenols include: trichlorophenols; chlorinated cresols; 2-chlorophenol; 2,4 dichlorophenol, and pentachlorophenol; 2,4-dinitrophenol.
(4) Shall not be increased more than 100% above background levels or to a maximum level of 500 microhms per centimeter in those surface waters in which the specific conductance of the water at the surface is less than 500 microhms per centimeter; and shall not be increased more than 50% above background level or to a maximum level of 5,000 microhms per centimeter for predominantly freshwaters as defined in Section 17-3.021 in which the specific conductance of the water at the surface is equal to or greater than 500 microhms per centimeter.
(5) Surface and Groundwaters - Substances in concentrations which injure, are chronically toxic to, or produce adverse physiological or behavioral response in humans, animals, or plants - none shall be present. Surface waters - Substance in concentrations which result in the dominance of nuisance species - none shall be present.
(6) Class II Surface Waters - the Shannon-Weaver diversity index of benthic macroinvertebrates shall not be reduced to less than 75% of established background levels as measured using organisms retained by a U.S. Standard No. 30 sieve and collected and composited from a minimum of three natural substrate samples, taken with Ponar type samplers with minimum sampling areas of 225 square centimeters. Class III Surface Waters - the Shannon-Weaver diversity index of benthic macroinvertebrates shall not be reduced to less than 75% of established background levels as measured using organisms retained by a U.S. Standard No. 30 sieve and, in predominantly freshwaters, collected and composited from a minimum of three Hester-Dendy type artificial substrate samplers of 0.10 to 0.15 m^2 area each, incubated for a period of four weeks, and, in predominantly marine waters, collected and composited from a minimum of three natural substrate samples, taken with Ponar type samplers with minimum sampling area of 225 square centimeters.
(7) Aldrin plus Dieldrin shall not exceed 0.003 µg/l; chlordane 0.004 µg/l; DDT 0.001 µg/l; Demeton 0.1 µg/l; Endosulfan 0.001 µg/l; Endrin 0.004 µg/l; guthion 0.01 µg/l; Heptachlor 0.001 µg/l; Lindane 0.004 µg/l; Malathion 0.1 µg/l; Methoxychlor 0.03 µg/l; Mirex 0.001 µg/l; Parathion 0.04 µg/l; Toxaphene 0.005 µg/l.
(8) The depth of the compensation point for photosynthetic activity shall not be reduced by more than 10% as compared to the natural background value.
(9) Aldrin plus Dieldrin shall not exceed 0.003 µg/l; Chlordane 0.01 µg/l in predominantly freshwaters and 0.004 µg/l in predominantly marine waters; DDT 0.001 µg/l; Demeton 0.1 µg/l; Endosulfan 0.003 µg/l in predominantly freshwaters and 0.001 µg/l in predominantly marine waters; Endrin 0.004 µg/l; guthion 0.01 µg/l; Heptachlor 0.001 µg/l; Lindane 0.01 µg/l in predominantly freshwaters and 0.004 µg/l in predominantly marine waters; Malathion 0.1 µg/l; Methoxychlor 0.03 µg/l; Mirex 0.001 µg/l; Parathion 0.04 µg/l; Toxaphene 0.005 µg/l.
(10) Endrin shall not exceed 0.2 µg/l; Lindane 0.004 mg/l; Methoxychlor 0.1 mg/l; Toxaphene 0.005 mg/l; 2,4-D 0.1 mg/l; 2,4,5-TP 0.01 mg/l.
(11) Beryllium - in predominantly freshwaters shall not exceed 0.011 milligrams per liter in waters with a hardness equal to or less than 150 (in milligrams per liter of $CaCO_3$) and shall not exceed 1.10 milligrams per liter in harder waters.
(12) Bacteriological Quality - fecal coliform bacteria shall not exceed a monthly average of 200 per 100 ml of sample, nor exceed 400 per 100 ml of sample in 10 percent of the samples, nor exceed 800 per 100 ml on any one day, nor exceed a total coliform bacteria count of 1,000 per 100 ml as a monthly average, nor exceed 1,000 per 100 ml in more than 20 percent of the samples examined during any month, nor exceed 2,400 per 100 ml at any time. Monthly averages shall be expressed as geometric means based on a minimum of 10 samples taken over a 30 day period. Either MPN or MF counts may be utilized.
(13) Cadmium - shall not exceed 5.0 micrograms per liter in predominantly marine waters; shall not exceed 0.8 micrograms per liter in predominantly freshwaters in water with a hardness (in milligrams per liter of $CaCO_3$) of less than 150, and shall not exceed 1.2 micrograms per liter in harder waters.
(14) General Surface Water Criteria pH - pH of receiving waters shall not be caused to vary more than one (1.0) unit above or below natural background pH of the water; the lower value shall not be less than six (6.0) and the upper value shall not be more than eight and one-half (8.5).
(15) Class II Waters pH - pH shall not be caused to vary more than one (1.0) unit above or below normal pH of coastal waters as defined in Section 17-3.05(1)(c), F.A.C., and not more than two-tenths (0.2) unit above or below normal pH of open waters as defined in Section 17-3.05(1)(c), F.A.C., and the lower value shall not be less than six and one-half (6.5) and the upper value not more than eight and one-half (8.5).
(16) Class III Waters pH - pH of receiving waters shall not be caused to vary more than one (1.0) unit above or below normal pH of predominantly freshwater as defined in Section 17-3.021, F.A.C., and coastal waters as defined in Section 17-3.05(1)(c). F.A.C., and not more than two tenths (0.2) units above or below normal pH of open waters as defined in Section 17-3.05(1)(c), F.A.C.; the lower value shall not be less than six (6.0) in predominantly freshwaters or less than six and one-half (6.5) in predominantly marine waters and the upper value not more than eight and one-half (8.5).
(17) 15 mg/l prior to March 1, 1979.
(18) 1.0 mg/l prior to March 1, 1979.
(19) "None detectable" prior to March 1, 1979, no detection limit was specified.

exception of small iron and pH deviations, such waters to be of good to excellent quality.

Non-installation Discharges

The State of Florida Water Quality Inventory (1980) has identified the following non-installation discharge sources to surface waters adjacent to Eglin Air Force Base:

Segment Number	Discharge Capacity MGD	Type	Discharger Name	Receiving Waters
32.1AA	1.7	STP	Ft. Walton Beach #1	Santa Rosa Sound*
33.2AA	1.2	STP	Santa Rosa Island Auth Pensacola Beach	Santa Rosa Sound
33.2BA	1.8	STP	Northeast VIC of Senic Highwsy	Bay Escambia Outfall TO
33.2BA	5.5	IND	American Cyanamid Co. Sr 191A & 1978	Escambia Bay Milton
33.2BA	1.9	IND	Air Products & Chemicals Inc. Hwy 90 E	Escambia Bay Near Pace
33.2CA	90.0	IND	Monsanto Co. Hwy 29 N. of Pensacola	Escambia River
33.3AA	1.8	STP	City of Milton 103 E Walker St.	Blackwater River Milton
33.4AA	1.5	STP	Crestview Lloyd Street	Blackwater Bay

STP: Sewage Treatment Plant
IND: Industrial

The above listed non-installation discharges may adversely impact the quality of large surface water bodies adjacent to Eglin Air Force Base such as Blackwater Bay, Santa Rosa Sound and Choctawhatchee Bay. A number of small, unlisted dischargers are known to exist along the south, west and north shores of Choctawhatchee Bay in the cities of Valparaiso, Niceville, Shalimar, Fort Walton Beach and Destin. These dischargers are primarily small boat construction, repair or maintenance facilities, whose wastes tend to be concentrated petroleum based products, paints based on heavy metals (primarily copper) and tend to be discharged directly to the bay in intermittent fashion. According to personnel at the Florida Department of Environmental Regulation the effect, if any, these small industries may have on local water quality is uncertain.

ENVIRONMENTALLY SENSITIVE CONDITIONS

Several environmentally sensitive conditions are present at Eglin Air Force Base which need to be considered when handling and disposing of hazardous waste materials.

1. The base is located within what must be regarded as a groundwater recharge zone for the upper sand and gravel aquifer. The topography

and regional soils favor rapid infiltration rates. It is reasonable to expect pollutants mobilized by precipitation to ultimately percolate downward into this sand and gravel aquifer. Discharge of this sand and gravel aquifer occurs to local springs, streams along the installation boundary and to the Gulf.

2. Primary drinking water is taken from the Upper Floridan aquifer which is physically separated from the overlying upper sand and gravel aquifer by the Pensacola clay layer. The Upper Floridan aquifer is recharged in outcrop areas North of the Eglin Reservation.
3. Wetlands are located on the base; however, not all have been identified concerning their size, location and functional value.
4. Shallow drinking water wells, are vulnerable to contamination originating from various Eglin AFB activities. Normally shallow water wells are not used for drinking water purposes.
5. Ecological areas such as preserved natural features, unique habitats and areas inhabited by endangered or sensitive species could be disrupted by contamination. Endangered or threatened species at Eglin include the Okaloosa darter, red-cockaded woodpecker, American Alligator, southern bald eagle, peregrine falcon, indigo snake, brown pelican, and pine barrens treefrog. No documented disruptions of the area's ecological characteristics due to waste disposal practices have occurred.

GEOLOGICAL ASPECTS OF POTENTIAL POLLUTANT MIGRATION

Geographical, geological and hydrological data evaluated for this study indicate the following:

1. High average annual rainfall(60 inches per year);
2. Predominantly sandy surficial soils with typically high infiltration capabilities, low runoff rates, and a seasonally high water level;
3. Consistent annual regional streamflow maintained by large basin capacity;
4. Sandy, permeable surficial soils, which comprise much of the water table "sand-and-gravel aquifer" are isolated from the underlying Upper Floridan Aquifer by the Pensacola Clay throughout most of Eglin Air Force Base.

From these major points it is indicated that unsecured waste materials deposited or stored at or near ground surface could be mobilized by the large rainfall rates, in either runoff or in groundwaters of the sand and gravel aquifer. Once in the sand and gravel aquifer, contaminants would probably be discharged in the base flow of the many springs and streams of Eglin Air Force Base. Further pollutant migration into the Upper Floridan Aquifer is unlikely due to the relatively high sand permeabilities favoring discharge to streams in this area and also due to the presence of the Pensacola Clay which overlies and confines the Upper Floridan. Ultimately, it would be reasonable to expect that mobilized contaminants will be discharged with streamflow to bays or the Gulf of Mexico.

SECTION 4

FINDINGS

SECTION 4
FINDINGS

To assess hazardous waste management at Eglin AFB, past activities of waste generation and disposal were reviewed. This section contains a summary of the wastes generated by activity, a description of disposal methods used at Eglin AFB, and an identification and evaluation of disposal sites located on the base. Figure 4.1 presents the decision tree utilized in the review of waste practices. This tree provided a logical algorithm for the consistent evaluation of all base practices.

PAST SHOP, LABORATORY AND TEST RANGE ACTIVITY REVIEW

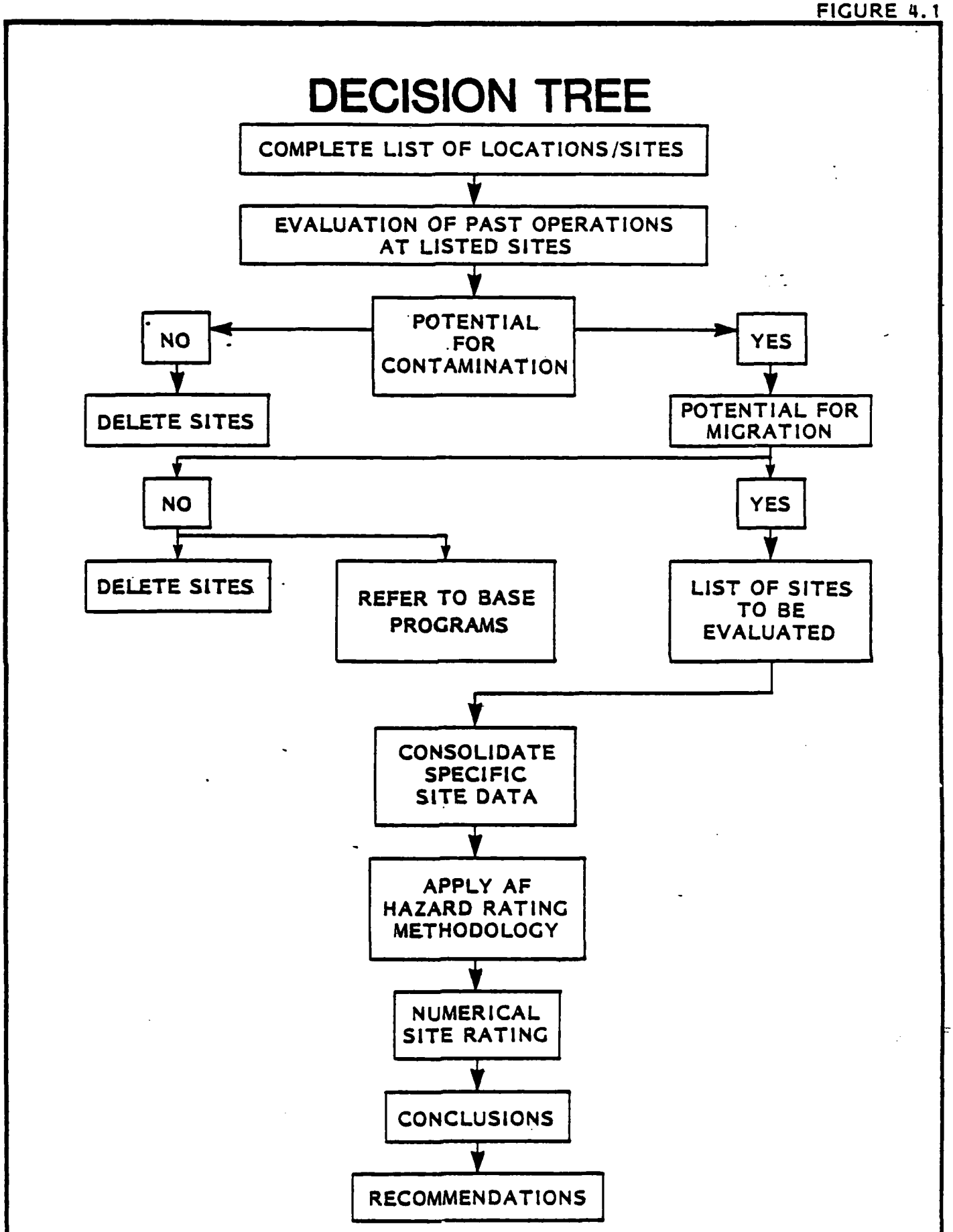
To determine past activities on the base that resulted in generation and disposal of hazardous waste materials, a review was conducted of current and past waste generation and disposal methods. This review consisted of interviews with base employees, a search of files and records, and site inspections.

Potentially hazardous wastes generated on Eglin can be associated with one of the following eight activities carried out on base:

- Industrial Operations (Shops)
- Research and Development Labs
- Fuels Management (POL)
- Pesticide and Herbicide Utilization
- Demiliterazation
- Fire Control Training
- Hazardous Waste Storage
- Weapons Testing

The following discussion addresses only those wastes generated on base which are either hazardous wastes or potentially hazardous wastes. In this discussion a hazardous waste is defined as hazardous by either the Resource Conservation and Recovery Act (RCRA), or the Eglin documents which have been reviewed. A potentially hazardous waste is one

FIGURE 4.1


DECISION TREE
COMPLETE LIST OF LOCATIONS/SITES
EVALUATION OF PAST OPERATIONS AT LISTED SITES
POTENTIAL FOR CONTAMINATION
NO
YES
DELETE SITES
POTENTIAL FOR MIGRATION
NO
YES
DELETE SITES
REFER TO BASE PROGRAMS
LIST OF SITES TO BE EVALUATED
CONSOLIDATE SPECIFIC SITE DATA
APPLY AF HAZARD RATING METHODOLOGY
NUMERICAL SITE RATING
CONCLUSIONS
RECOMMENDATIONS
AF EVALUATION OF CONTRACTOR RECOMMENDATIONS IN CONJUNCTION WITH OTHER INSTALLATIONS

which was suspected of being RCRA hazardous although insufficient data was available to fully characterize the waste.

Industrial Operations (Shops)

Major mission support activities are conducted at Eglin AFB by various groups and squadrons through industrial shops. These shops maintain, fabricate and repair components and parts for aircraft and ground equipment. A list of active and deleted industrial shops was obtained from the Bioenvironmental Engineering Office files and served as a starting point for the review of past waste generation and disposal practices of hazardous materials. Present and past building locations and location service dates were obtained from the office files. Finally, an indication of hazardous material usage and hazardous waste generation was obtained from these files for active and deleted industrial shops. A summary of active, deleted and discontinued shops is presented in Appendix D, Table D.1.

Those shops which may pose a potential for contamination of ground-waters or surface waters were then selected for further review and investigation by shop interviews. A shop was considered to pose a potential for contamination if hazardous materials were handled, hazardous wastes were generated, or the quantity of hazardous waste was significant enough to pose problems if improperly handled. Also, any indication of non-standard hazardous waste disposal practices at the shop facility were reviewed. Past waste generation and disposal methods were obtained for each shop reviewed. Also, a time line was constructed for each major hazardous waste item showing the disposal practices and their respective period of operation. The results of this detailed shop review are listed in Table 4.1, however, several shops which may generate hazardous waste were eliminated from Table 4.1 due to insignificant waste quantities. This table indicates the shop building location, the hazardous material utilized, the hazardous waste quantity disposed, and the disposal methods on a time line. For the time line information, the solid line indicates confirmed time frame data by base personnel while the dotted line indicates unconfirmed time frame information obtained from base personnel or records.

The shop facilities which pose a potential for migration of waste into the ground waters or surface waters were then determined. A shop

TABLE 4.1

INDUSTRIAL OPERATIONS (Shops)

WASTE GENERATION

EGLIN MAIN

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	TREATMENT, STORAGE AND DISPOSAL METHOD(a) 1950 1960 1970 1980
33 CRS				
PROPULSION BRANCH	1352	WASTE FUEL	145 GALS./MO.	SALVAGE → DPDO
		WASTE OIL	20 GALS./MO.	SALVAGE → DPDO
		TRICHLOROETHYLENE	2 GALS./MO.	SALVAGE → DPDO
33 EMS				
AEROSPACE GROUND EQUIPMENT (AGE)	1353	WASTE OIL	100 GALS./MO.	SALVAGE → DPDO
		PD-680	150 GALS./MO.	SALVAGE → DPDO
		TOLUENE/MEK	5 GALS./MO.	SALVAGE → DPDO
ARMAMENT SYSTEMS	1360	PD-680	55 GALS./MO.	SALVAGE → DPDO
CORROSION CONTROL	1353	PD-680	150 GALS./MO.	SALVAGE → DPDO
		PAINT STRIPPERS	55 GALS./2 MOS.	O/W SEPARATOR TO SAN. SEWER
MISSILE MAINTENANCE	1285	PAINT STRIPPERS	6 GALS./MO.	METHOD UNKNOWN SAND PIT
		MEK	2 GALS./MO.	METHOD UNKNOWN SAND PIT
		TRICHLOROETHYLENE	2 GALS./MO.	METHOD UNKNOWN SAND PIT
CORROSION CONTROL WASHRACK	1332	PD-680, WASH WATER	250 GALS./WK.	O/W SEPAR. TO DRAINAGE DITCH

KEY

———— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - - - ASSUMED TIME FRAME DATA BY SHOP PERSONNEL

*BASED ON CURRENT RATES AND BEST ESTIMATES OF PAST RATES.

TABLE 4.1 (cont'd)

INDUSTRIAL OPERATIONS (Shops)

WASTE GENERATION

EGLIN MAIN (cont'd)

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	TREATMENT, STORAGE AND DISPOSAL METHOD(s) 1950 1960 1970 1980
55 ARRS				
AGE SHOP	428	PD-680	55 GALS./MO.	SALVAGE DPDO
		WASTE OIL	20 GALS./MO.	SALVAGE DPDO
CORROSION CONTROL	421	PAINT STRIPPERS	2 GALS./MO.	BOWSER TO DPDO
		TOLUENE/MEK	2 GALS./MO.	BOWSER TO DPDO
ENGINE SHOP	421	WASTE OIL	40 GALS./MO.	BOWSER TO DPDO
		HYDRAULIC FLUID	15 GALS./MO.	BOWSER TO DPDO
		JP-4	15 GALS./MO.	BOWSER TO DPDO
3201 ABGP				
GOLF COURSE MAINTENANCE	1530	WASTE OILS	150 GALS./YR.	SALVAGE DPDO
		WASTE PESTICIDES RESIDUES & CONTAINERS	20 GALS./YR.	LANDFILLS
3201 TRANS				
FIRE TRUCK MAINTENANCE	500	WASTE OILS	80 GALS./MO.	SALVAGE DPDO
		TRANSMISSION FLUIDS	15 GALS./MO.	SALVAGE DPDO
		PD-680	40 GALS./MO.	SALVAGE DPDO
HEAVY EQUIPMENT MAINTENANCE	693	CLEANING SOLVENTS	10 GALS./MO.	SALVAGE DPDO
		WASTE OILS	440 GALS./MO.	SALVAGE DPDO

KEY

———— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - - - - ASSUMED TIME FRAME DATA BY SHOP PERSONNEL

TABLE 4.1 (cont'd)

INDUSTRIAL OPERATIONS (Shops)

WASTE GENERATION

EGLIN MAIN (cont'd)

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	TREATMENT, STORAGE AND DISPOSAL METHOD[a] (1950 / 1960 / 1970 / 1980)
3201 TRANS (CONTINUED)				
POL	562	WASTE OILS	50 GALS./MO.	SALVAGE — DPDO
		WASTE FUELS	50 GALS./MO.	SALVAGE — DPDO
		PD-680	3 GALS./MO.	SALVAGE — DPDO
3202 CES				
HEAVY EQUIPMENT MAINTENANCE	693	ENGINE OILS, FLUIDS	175 GALS./MO.	BOWSER TO — DPDO
LIQUID FUELS SECTION	690	THINNERS, SOLVENTS	200 GALS./YR.	SALVAGE — DPDO
		OTHER WASTE FUELS (MOGAS, etc)	60 GALS./YR.	SALVAGE, DPDO
		WASTE JET FUELS	240 GALS./YR.	FIRE TRAINING
PAINT SHOP	690	MEK, SOLVENTS	15 GALS./MO.	SALVAGE — DPDO
		KEROSENE	300 GALS./MO.	SALVAGE — DPDO
RANGE SUPPORT SECTION	691	WASTE MOTOR OIL	250 GALS./MO.	SALVAGE — DPDO
3211 FMS				
AGE SHOP	101	MIXED FUELS	2000 GALS./MO.	SALVAGE — DPDO
		HYDRAULIC FLUIDS	60 GALS./MO.	SALVAGE — DPDO
		WASTE OILS	85 GALS./MO.	SALVAGE — DPDO
		PD-680	25 GALS./MO.	BOWSER TO CONTRACTOR — DPDO

KEY

———— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - - - - ASSUMED TIME FRAME DATA BY SHOP PERSONNEL

TABLE 4.1 (cont'd)

INDUSTRIAL OPERATIONS (Shops)

WASTE GENERATION

EGLIN MAIN (cont'd)

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	TREATMENT, STORAGE AND DISPOSAL METHOD[a] 1950 1960 1970 1980
3211 FMS (CONTINUED)				
CORROSION CONTROL	72	PD-680	55 GALS./MO.	WASHRACK SUMP → O/W SEPAR. TO SAN. SEWER
ELECTRIC SHOP	136	ENGINE OIL	3 GALS./MO.	FIRE TRAINING → BOWSER TO DPDO
		PD-680	2 GALS./MO.	FIRE TRAINING → BOWSER TO DPDO
		BATTERY ACID SOLUTION	20 GALS./MO.	NEUTRALIZED THEN TO GROUND
FIBERGLASS SHOP	127	SOLVENTS	20 GALS./MO.	SALVAGE → DPDO
		DUST SPRAY WASH WATER	15 GALS./MO.	DRAINAGE DITCH
FUEL SYSTEMS REPAIR	135	WASTE FUELS	100 GALS./MO.	SALVAGE → DPDO
JET ENGINE SHOP	134	WASTE OIL	100 GALS./MO.	FIRE TRAINING → DPDO
		WASTE FUELS	20 GALS./MO.	FIRE TRAINING → DPDO
		CARBON REMOVER	20 GALS./MO.	(NOT IN USE) → U.G. TANK, DPDO
		PD-680	55 GALS./2 MOS.	SALVAGE → DPDO
NON-DESTRUCTIVE INSPECTION (NDI)	411	MIXED SOLVENTS, OILS	200 GALS./MO.	O/W SEPAR. THEN TRUCK → DPDO; PUMP OUT TO CONTRACTOR'S SITE
PAINT SHOP	127	SOLVENTS	55 GALS./MO.	SALVAGE → DPDO
		PAINT BOOTH WATER WASTES	50 GALS./2 WKS.	SANITARY SEWER → DRAINAGE DITCH (@ OLD BLDG. 70)

KEY

———— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

·-------- ASSUMED TIME FRAME DATA BY SHOP PERSONNEL

*NOTE: THE CONTRACTOR'S SITE IS AN ASPHALT PLANT.

TABLE 4.1 (cont'd)

INDUSTRIAL OPERATIONS (Shops)

WASTE GENERATION

EGLIN MAIN (cont'd)

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	TREATMENT, STORAGE AND DISPOSAL METHOD[a] 1950 1960 1970 1980
3211 FMS (CONTINUED)				
PNEUDRAULICS SHOP	130	HYDRAULIC FLUIDS, OILS	30 GALS./MO.	SALVAGE DPDO
		SOLVENTS	40 GALS./MO.	SALVAGE DPDO
		CARBON REMOVER	10 GALS./MO.	SALVAGE DPDO
WELDING/ELECTROPLATING SHOP	127	PLATING WASTE SOLUTION	1 GAL./MO.	DRAINAGE DITCH U.G. CELLS THEN SAN. SEWER
3210 OMS				
GROUND EQUIPMENT SUPPORT	110	HYDRAULIC FLUID	5 GALS./MO.	SALVAGE DPDO
		PD-680	1 GAL./MO.	SALVAGE DPDO

KEY

——— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - - - ASSUMED TIME FRAME DATA BY SHOP PERSONNEL

FUELS	15 GALS./MO.	SQUADRON NOT ACTIVE → DPDO
WASTE OILS	10 GALS./MO.	SQUADRON NOT ACTIVE → DPDO
HYDRAULIC FLUID	15 GALS./MO.	SQUADRON NOT ACTIVE → DPDO
SOLVENTS	40 GALS./MO.	SQUADRON NOT ACTIVE → DPDO
THINNERS	20 GALS./MO.	SQUADRON NOT ACTIVE → DPDO
WASHRACK SOLUTION WASTE	100 GALS./MO.	SQUADRON NOT ACTIVE → O/W SEPAR. TO SAN. SEWER
PD-680	5 GALS./MO.	FIRE TRAINING → DPDO
WASTE OILS	35 GALS./MO.	FIRE TRAINING → DPDO
FUELS	10 GALS./MO.	FIRE TRAINING → DPDO
WASTE OILS	10 GALS./MO.	SQUADRON NOT ACTIVE → DPDO
PD-680	100 GALS./MO.	DRAIN DITCH → O/W SEPAR. TO SAN. SEWER
WASTE FUEL	50 GALS./MO.	SQUADRON NOT ACTIVE → FIRE TRAINING
PD-680	10 GALS./MO.	SQUADRON NOT ACTIVE → DPDO
WASTE FUEL, OILS	30 GALS./MO.	SQUADRON NOT ACTIVE → DPDO
PD-680	70 GALS./MO.	SQUADRON NOT ACTIVE → DRAIN DITCH → O/W SEPAR. TO SAN. SEWER

TABLE 4.1 (cont'd)

INDUSTRIAL OPERATIONS (Shops)

WASTE GENERATION

DUKE FIELD (cont'd)

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	TREATMENT, STORAGE AND DISPOSAL METHOD(s) 1950 1960 1970 1980
728 TCS VEHICLE MAINTENANCE	3872	WASTE OILS	100 GAL./MO.	SQUADRON NOT ACTIVE → DPDO

KEY

——— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - - - ASSUMED TIME FRAME DATA BY SHOP PERSONNEL

TABLE 4.1 (cont'd)

INDUSTRIAL OPERATIONS (Shops)

WASTE GENERATION

HURLBURT FIELD

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	TREATMENT, STORAGE AND DISPOSAL METHOD(a) 1950 1960 1970 1980
823 CES (RED HORSE)				
PAINT SHOP	91125	PAINT THINNERS	55 GALS./2 WKS.	POL WASTE TANKS TO DPDO
VEHICLE MAINTENANCE	91128	OILS	50 GALS./MO.	POL WASTE TANKS TO DPDO
		HYDRAULIC FLUID	15 GALS./MO.	POL WASTE TANKS TO DPDO
834 CES				PCB STORAGE BLDG. 90135
EXTERIOR ELECTRIC SHOP	90138	PCB-ASKEREL STORAGE	1,320 GALS.	OUTSIDE STORAGE AT BLDG 90004
PAINT SHOP	90138	THINNERS ON RAGS, REFUSE	5 GALS./MO.	DUMPSTER TO LANDFILL
		PAINT BOOTH SCRUBBER WATER	110 GALS./2 WKS.	PUMP OUT BY CES TO SAN. SEWER
834 CRS				
ENVIRONMENTAL SYSTEMS	90700	PD-680	30 GALS./6 MOS.	SALVAGE DPDO
		ACID SOLUTIONS	25 GALS./MO.	NEUTRALIZED THEN TO SAN. SEWER
MACHINE SHOP	90700	PD-680, OILS	2 GALS./MO.	SALVAGE DPDO
PROPULSION SHOP	90131	PD-680	15 GALS./MO.	POL WASTE TANK TO DPDO
		WASTE OILS	60 GALS./MO.	POL WASTE TANK TO DPDO
STRUCTURAL REPAIR	90700	FIBERGLASS WASTES, RAGS	2 GALS./MO.	REFUSE DUMPSTER TO CO. LANDFILL

KEY

——— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - - - ASSUMED TIME FRAME DATA BY SHOP PERSONNEL

TABLE 4.1 (cont'd)

INDUSTRIAL OPERATIONS (Shops)

WASTE GENERATION

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	TREATMENT, STORAGE AND DISPOSAL METHOD[a] 1950 1960 1970 1980
836 CSG				
AUTO HOBBY SHOP	90612	WASTE OIL	100 GALS./MO.	POL WASTE TANK TO DPDO ----------
836 EMS				
AGE SHOP	90822	OILS, SOLVENTS	50 GALS./MO.	POL WASTE TANK TO DPDO ----------
		PD-680	100 GALS./MO.	SALVAGE DPDO ----------
ARMAMENTS SYSTEMS	90731	PD-680	35 GALS./MO.	POL WASTE TANK TO DPDO ----------
CORROSION CONTROL	90700	SOLVENTS	165 GALS./2 MOS.	POL WASTE TANK TO DPDO ----------
		THINNERS	(INCLUDED WITH SOLVENTS)	POL WASTE TANK TO DPDO ----------
		PD-680	40 GALS./MO.	WASHRACK TO O/W SEPAR. TO SAN. SEWER ----------
WHEEL AND TIRE SHOP	90700	PAINT STRIPPERS	100 GALS./6 MOS.	POL WASTE TANK TO DPDO ----------
		PD-680	(INCLUDED WITH PAINT STRIPPERS)	POL WASTE TANK TO DPDO ----------
836 TRANS				
ALLIED TRADES PAINT BOOTH	90111	PAINT SLUDGES	2 GALS./MO.	REFUSE DUMPSTER TO CO. LANDFILL ----------
		PAINT BOOTH SCRUBBER WATER	500 GALS./WK.	DRAIN DITCH ----------
BATTERY SHOP	90102	BATTERY ACID SOLUTION, WATER	40 GALS./WK.	NEUTRALIZED TO O/W SEPAR. TO SAN. SEWER ----------

KEY

———— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - - - - ASSUMED TIME FRAME DATA BY SHOP PERSONNEL

facility was considered to pose a potential for migration to groundwaters or surface waters if past hazardous waste disposal practices may have provided a pathway for contamination migration. In most cases, the disposal practice in question took place at or near the shop building. A detailed description of each site treatment storage and/or disposal activity suspected of potential pollutant migration is listed below with an evaluation of the potential site problems. Appendix E contains site location maps for those areas of Eglin AFB which contain potential site contamination. In the final analysis, the shops discussed herein are considered low priority sites with regard to Phase II recommendations.

Eglin Main

Missile Maintenance, Bldg. 1285 (33 EMS) (Site IS1). This shop facility utilizes a sand pit located near building 1285 for paint stripping of large missile component items. Paint strippers and methyl ethyl ketone (MEK) have been used since 1976 at the sand pit for the stripping operations. The waste quantity of these compounds has ranged from two to six gallons per month. The paint stripping practice prior to 1976 is not known by present shop personnel. The approximate UTM coordinates for this building location are EJ 544875, 3373500.

Paint stripper fluids and MEK are considered toxic organic compounds in the environment. MEK has an LD_{50} in rats of approximately 7 ml/kg. MEK may biodegrade in small quantities with sufficient bacteria population. In batch quantities, MEK may persist in the environment. Utilization of this sand pit for stripping operations may pose a potential for waste migration due to the subsurface conditions, the close proximity to water well No. 66, and the close proximity to the West Branch, Tom's Creek. The subsurface conditions include fine grain sandy and silty soils to a depth of approximately 15 feet. This soil condition may facilitate movement of paint stripper fluids and MEK away from the sand pit into the surface aquifer.

Water well No. 66 (Bldg. 1280) is a 6-inch water supply well with a depth of 650 feet, approximately 200 feet into the Floridan Aquifer. The well intake is believed to be protected from the surface aquifers by clay layers. The use of the sand pit in the vicinity may pose a potential for waste migration if the well casing or cavity is in poor condition.

The sand pit is approximately 750 feet from the West Branch, Tom's Creek, which flows to Tom's Bayou. The elevation of the sand pit is approximately 60 feet MSL and the elevation for the bottom of the branch is approximately 10 feet MSL. Therefore, migration of waste paint strippers and MEK from the sand pit through the sandy soils to this branch is likely.

Electric Shop, Bldg. 136 (3211 FMS) (Site IS2). This facility neutralizes battery acid from both air and ground equipment batteries. According to shop personnel, the battery acid in neutralized form is then deposited onto the ground by a building drain pipe. Since the early 1960's, approximately 20 gallons per month of neutralized battery acid have been disposed around the shop grounds. The UTM coordinates for this shop (Bldg. 136) are EJ 546950, 3371500.

Disposal of neutralized, diluted battery acid onto the ground poses a potential for migration of lead compounds into surface and ground waters. Lead wastes are considered highly toxic to aquatic environments and may persist indefinitely in normal aqueous pH conditions. The battery acid should be considered a hazardous waste due to lead content. The discharge of neutralized, diluted battery acid flows into a drainage ditch which leads to a creek which enters Jack's Lake. Also, the sandy, silty soil condition surrounding the shop may provide a path for the neutralized battery acid to enter the surface aquifer.

Paint Shop, Bldg. 127 (3211 FMS) (Site IS3). This shop performed spray paint operations using a waterfall fume and spray collection device. The water recirculation tank is cleaned once per two weeks and during each cleaning, paint float skimmings and bottom sludge are collected and disposed in the trash dumpster. The paint booth scrubbe water containing paint residue is discharged to a culvert drain which flows to a drainage ditch then to a tributary and then to Jack's Lake. The quantity of paint booth water is approximately 150 gallons per tank cleaning. This waste disposal procedure has been in practice since 1976. Prior to 1976, the waste liquid was disposed into the sanitary sewer system at the shop's previous building location (old building 70). The approximate present UTM coordinates for this shop are EJ 546700, 3371200.

The disposal of paint waste liquid into drainage ditches poses a potential of waste migration to subsurface and surface waters due to subsurface conditions and proximity to surface waterways. The subsurface conditions surrounding the shop included fine grain sandy, silty soils. This soil condition in the ditches may have provided a path for waste to leach into the surface aquifer. Also, the use of the drainage ditches for waste liquid discharges has provided a path for waste movement through surface waters into Jack's Lake. Therefore, the migration of waste paint booth liquid from this shop to off-base subsurface and surface waterways is likely. Paint waste liquids may persist in an aquatic environment as sludge or skim and may be harmful to aquatic life.

Welding/Electroplating, Bldg. 127 (3211 FMS) (Site IS4). This shop utilizes two underground concrete holding cells installed in 1978 which treat electroplating waste solutions. These solutions undergo pH adjustment to approximately pH 9 prior to discharge to the sanitary sewer system. Overflows of these cells during rain events have occurred. Prior to installation of the cells, the waste plating solutions were disposed into a culvert drain which flows into a drainage ditch and then into Jack's Lake. The quantities of solutions disposed are one ounce per day of cadmium cyanide, cadmium oxide, sodium hydroxide, and sodium cyanide. The approximate UTM coordinates for this shop are EJ 546700, 3371200.

Plating wastes are considered acutely toxic to aquatic and related environments. The waste may persist indefinitely in ground-water aquifers. Past overflows from the existing holding cells and past plating solution discharges into drainage ditches pose a potential for waste migration to subsurface and surface waters due to the subsurface conditions and the proximity of surface waterways. The subsurface conditions surrounding the shop include fine grain sandy, silty soils which may have provided a path for wastes to leach into the surface aquifer. Also, the use of the drainage ditches for waste liquid discharges has provided a path for waste movement through surface waters into Jack's Lake. Therefore, the migration of waste plating solutions from this shop to off-base subsurface and surface waterways is likely.

Duke Field

Flight Line Drainage Ditch (Site IS5). The drainage ditch located on the west side of the main aircraft parking apron provides surface runoff drainage for the flight line shops, hangars and runways. Normally, no hazardous materials or wastes are discharged into this drainage ditch. Occasionally the Aerospace Ground Equipment Shop (Bldg. 3057) washes ground equipment and the wash water may enter the drainage ditch. Also, any oil spills occurring on the aircraft washrack (Bldg. 3000) which are not directed to the oil/water separator may be flushed into the drainage ditch. The drainage ditch terminates in a manmade hole constructed around 1960 that is approximately 80 feet in diameter at the top rim and approximately 15 feet deep. No other surface waters enter or leave this termination hole. The UTM coordinates for the termination hole are EJ 545350, 3389800.

The existence of the flightline drainage ditch may pose a potential for migration of waste fuels, oils, or wash water due to the subsurface conditions and proximity to a branch of Juniper Creek. The subsurface conditions include coarse sand mixed with clay silt and is expected to have high permeability. The surface aquifer is estimated to be 25 feet below average ground level. Therefore, migration of drainage ditch water which may contain quantities of fuel and oil into the surface aquifer is likely.

The drainage termination hole is located approximately 3300 feet due north from head waters of a branch of Juniper Creek (EJ 545700, 3388850). The elevation of the bottom of the hole is approximately 180 feet MSL. The creek bottom elevation is approximately 100 feet MSL. Therefore, migration of drainage ditch runoff water through the coarse sandy soils to the branch of Juniper Creek is likely.

Washwater containing fuels and oils, considered moderately biodegradable, may persist for a small amount of time in a ground-water environment. Some unsightly ground cover conditions may occur. Based on the known past waste spills, location of site, waste persistence, and hydrological conditions the potential for migration of pollutant contamination across installation boundaries is minimal.

Hurlburt Field

Allied Trades Paint Booth, Bldg. 90111 (834 Trans) (Site IS6). This facility uses a waterfall recirculation tank for collection of paint spray and fumes; it is emptied once per week. The quantity of water and paint residue emptied is approximately 500 gallons. This quantity of waste liquid is discharged to a pipe which leads to a drainage ditch adjacent to the paint booth. The drainage ditch flows into an unnamed stream which flows into Santa Rosa Sound. This disposal method has been used since approximately 1975. The UTM coordinates for the shop are EJ 529140, 3364800.

The disposal of paint spray booth liquid wastes to the drainage ditch may pose a potential for waste migration into surface and ground waters due to the subsurface conditions and the use of an adjacent drainage ditch for disposal. The fine grain sandy, silty soil in the ditch bed may provide a path for waste seepage into the surface aquifer. The surface aquifer is approximately 5 feet to 8 feet below grade level. Also, past direct discharges of paint liquid wastes to the drainage ditch provide a surface path for migration of waste off base property and into the Santa Rosa Sound adjacent to Dock 90925. (EJ 528700, 336850). Therefore, past migration of paint booth liquid wastes into ground waters and surface waters is likely.

Paint waste liquids may persist in an aquatic environment as a sludge or skim and may be harmful to aquatic life. Frequent batch discharges may create unsightly shore conditions along Santa Rosa Sound.

Laboratories

The laboratory functions were reviewed simultaneously with the industrial shops. These laboratory facilities are included in the master list, Table D.1, contained in Appendix D. From the master list, those labs which utilize hazardous materials, generate hazardous waste, dispose hazardous waste in significant quantities and are considered to have a potential for contamination of ground water or surface water were further investigated for their disposal practices. The potential was based on quantities of wastes generated by the lab and individual disposal methods shown in the Bioenvironmental Engineering Office files. The laboratories which were reviewed for a potential for contamination

are listed in Table 4.2. This table indicates the shop location, the hazardous material used, the hazardous waste quantity disposed, and the disposal method with a time line.

The laboratory facilities which may pose a potential for migration of contamination were then determined. A laboratory facility is considered to pose a potential for migration of waste to ground water or surface water if the facility has utilized a disposal practice which provides a direct pathway for waste into the surface aquifer. A description and evaluation of those laboratories which may pose a potential for migration of waste to the ground water is presented herein.

High Explosive Research and Development Facility (Site IS8). The UTM coordinates for this site are EJ 545870, 3373530. All sink drains and floor washings from the HERD facility drain to the drainage fields. Each drainage field is approximately 30 feet by 100 feet. The drainings from Buildings 1202 and 1206 pass through a 20-micron screen before flowing to the drainage field. The screenings (explosive residue) are removed periodically and are disposed of by EOD.

Any contaminated solvents, chemicals, explosives or screenings that are collectible are collected by HERD personnel and disposed of by EOD. Only floor washings and sink drainage go to the drain field. An estimate of the actual amount that goes to the drainage field versus EOD disposal is not available. The drainage field disposal practice has been utilized for approximately five or six years.

Building #991, the explosive dynamics testing facility, does not generate any significant quantity of wastes. Any waste that is generated is explosive and is detonated or collected and disposed of by EOD.

Surface water and ground water data for the immediate vicinity of the HERD facility is limited. At present no indication of water contamination from the HERD facility has been found in this limited data. Because hazardous materials are disposed of in the drainage field (acetone, hexane, potentially dissolved TNT, RMS and HMX), this facility may pose a potential for hazardous waste migration to surface aquifers. Due to minimal amounts of the above materials, the potential for migration past installation boundaries is considered minimal.

TABLE 4.2

LABORATORIES FACILITIES

WASTE GENERATION

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	TREATMENT, STORAGE AND DISPOSAL METHOD[a] 1950 1960 1970 1980
EGLIN MAIN				
AFATL LABS	SITE C-64A	AMYL NITRATE	110 GALS.	THESE MATERIALS WERE REMOVED FROM SITE C-64A ON 5/21/81. ALL ITEMS WERE TAKEN TO SITE C-52 DURING JUNE, 1981, AND DETONATED WITH EXPLOSIVES.
		N-PROPYL NITRATE	50 GALS.	
		PROPYLENE OXIDE	300 GALS.	
		METHYL ACETYLENE	20 LBS.	
		CYCLOPROPANE	20 LBS.	
		ALLENE	20 LBS.	
		ETHYL ACETYLENE	20 LBS.	
PARKS PHOTO LAB	55	SILVER PHOTO WASTES, WATER	400 GALS./MO.	ELECTRODE RECOVERY → CARTRIDGE RECOVERY THEN SAN. SEWER
		OTHER PHOTO WASTES, WATER	350 GALS./MO.	SANITARY SEWER
GRAPHICS LAB	1	SILVER PHOTO WASTES, WATER	20 GALS./MO.	SANITARY SEWER → RECOVERY THEN SAN. SEWER
		OTHER PHOTO WASTES, WATER	30 GALS./MO.	SANITARY SEWER
HIGH EXPLOSIVES RESEARCH AND DEVELOPMENT (HERD) FACILITIES	1200, 1202, 1206	SOLVENTS & FLOOR WASHWATER	100 GALS./MO.	SUMP SCREENS TO DRAINAGE FIELD (NOT IN OPERATION)
		CONTAMINATED WASTE SOLIDS	200 LBS./MO.	(NOT IN OPERATION) → EOD
		COLLECTIBLE SOLVENTS, CHEMS	55 GALS./MO.	EOD
CLIMATIC LAB	440	SOLVENTS, OILS FLOOR WASH	200 GALS./MO.	DRAINAGE DITCH
MEDICAL X-RAY (USAF HOSP.)	2825	DEVELOPER	320 GALS./MO.	SAN. SEWER
		FIXER	400 GALS./MO.	SILVER RECOV. THEN SAN. SEWER
DENTAL X-RAY (USAF HOSP.)	2825	DEVELOPER	20 GALS./MO.	SAN. SEWER
		FIXER	40 GALS./MO.	SILVER RECOV. THEN SAN. SEWER

KEY

——— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - - - ASSUMED TIME FRAME DATA BY SHOP PERSONNEL

TABLE 4.2 (cont'd)

LABORATIES FACILITIES

WASTE GENERATION

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	TREATMENT, STORAGE AND DISPOSAL METHOD(S) 1950 1960 1970 1980
DUKE FIELD				
NON-DESTRUCTIVE INSPECTION (NDI) LAB	3025	PENETRANT, DEVELOPER, EMULSIFIER	30 GALS./MO.	SHOP DIVIDED ELSEWHERE → DPDO
MEDICAL & DENTAL X-RAY	3078	DEVELOPER	5 GALS./MO.	→ SAN. SEWER
		FIXER	5 GALS./MO.	SILVER RECOV. THEN SAN. SEWER
HURLBURT FIELD				
PHOTO LAB	90759	SILVER PHOTO WASTES	40 GALS./MO.	SANITARY SEWER → RECOVERY THEN SAN. SEWER
		OTHER PHOTO WASTES	40 GALS./MO.	SANITARY SEWER →
GRAPHICS LAB	90758	PHOTO WASTES	5 GALS./MO.	SANITARY SEWER →
NDI LAB	90131	PENETRANT	10 GALS./MO.	(NOT IN OPERATION) → O/W SEPAR. TO SAN. SEWER
		EMULSIFIER	10 GALS./MO.	(NOT IN OPERATION) → O/W SEPAR. TO SAN. SEWER
		X-RAY DEVELOPER	3 GALS./MO.	(NOT IN OPERATION) → O/W SEPAR. TO SAN. SEWER
		X-RAY FIXER	5 GALS./MO.	(NOT IN OPERATION) → RECOVERY AT PHOTO LAB.
MEDICAL X-RAY	90310	DEVELOPER	12 GALS./MO.	→ SANITARY SEWER
		FIXER	15 GALS./MO.	SILVER RECOV. THEN SAN. SEWER
DENTAL X-RAY	90310	DEVELOPER	4 GALS./MO.	→ SANITARY SEWER
		FIXER	4 GALS./MO.	→ SANITARY SEWER

KEY

——— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - - - ASSUMED TIME FRAME DATA BY SHOP PERSONNEL

Hydrazine and liquid ammonia were stored in small quantities at site A-15 both in sealed containers for insertion into the Bomarc missile and in storage tanks. At no time is hydrazine or ammonia transferred from one container to another. The propellant for the Bomarc missile is solid and is never transferred from one container to another at this facility.

The only waste generated routinely at this facility is sanitary waste which is fed into a drain field. No other significant quantities of non-sanitary wastes go to this drain field.

During past Bomarc launchings the missile itself has generated wastes in the form of exhaust gases. Some misfirings have resulted in spills of nitric acid in the area of the launch site. These past spills do not present a potential for migration of contamination.

In the event of past hydrazine or ammonia leaks the leak has been isolated and eliminated and personnel protected according to acceptable technology. Hydrazine leaks at this facility have been rare and have presented no long-term problems in the past due to proper handling techniques.

Fuels Management

Eglin Main

The Fuels Management Section is responsible for receiving, storing and distributing the following grades of fuel:

- JP-4
- JP-5
- JP-8
- MOGAS
- AVGAS
- Diesel Fuel
- Solvents
- Cryogenic Fluids

There are 125 fuels management tanks on the base with 1000 gallons or more storage capacity. Overall individual tank storage capacity ranges from 55 gallons to 45,000 gallons.

The key JP-4 fuel facilities, although not inclusive, consist of five fuel tanks with receiving and off loading facilities located at the 8th Street (Main Base) Storage Area. JP-4 is received by barge and JP-4

Climatic Laboratory, Building 440 (Site IS7). The UTM coordinates for this site are EJ 547120 3371360. All solid wastes generated and any contained contaminated liquids have been sent to DPDO for disposal. All floor washings and any uncontained spills were discharged into a storm sewer that flows directly into a small unnamed creek located across Eglin Boulevard from the climatic laboratory (Building #440). This creek flows into Jack's Lake which flows into the Choctawhatchee Bay in the vicinity of Camp Robbins.

Small quantities of the following materials could be present in the liquid discharge from the climatic laboratory under normal operating conditions:

- Lubricants
- Aircraft fuels
- Pump oils
- Refrigeration oils
- Yellow rescue dye (used during engine ice testing)
- Calcium chloride
- Methylene chloride
- Evaporative cooling tower blowdown (algicides, biocides, scale control chemicals)
- Spills of any other chemical used in the facility

The only significant chemical storage at this facility is methylene chloride and calcium chloride solution which are used as backup refrigerants. Approximately 130,000 gallons of methylene chloride are stored in two, above ground, double walled, spherical holding tanks. These tanks are not diked.

Although small leaks of methylene chloride have occurred in the past from the piping networks, no holding tank leaks or ruptures have occurred. The potential for past off-base migration of contaminants from this facility via Jack's Lake is minimal.

Bomarc Facility. The UTM coordinates for this facility are EJ 518550, 3361650. The Bomarc Facility is located at A-15 on Santa Rosa Island and is used for occasional launchings of the Bomarc missile which is used as a target for pilot training. The site is located in a predominantly sandy area with high ground-water table.

TABLE 4.3

PAST PESTICIDE AND HERBICIDE UTILIZATION AT EGLIN AFB

Material Used	Purpose	Period of Usage	Area Applied	Quantity	Waste Material	Waste Disposal Practice
DDT	Aerial Spray Mosquito Control	<1955-1963	Eglin AFB	20,000 gal/yr 4% spray 10,000 gal	1) Empty, unrinsed 55 gallon drums 2) Excess DDT	Scrap metal pile - DPDO Burned in Fire Training area on Flightline at Eglin Main
DDT	Dogfly Control	<1955-1963	Shoreline of Choctawhatchee Bay	5000 gal/yr 2% spray	1) Empty, unrinsed 55 gallon drums	Scrap metal pile - DPDO
Methoxychlor	Dogfly Control	1963-1967	Shoreline of Choctawhatchee Bay	5000 gal/yr 2% spray	1) Empty, unrinsed 55 gallon drums	Scrap metal pile DPDO - Eglin Main Landfills
DDT	Thermal Fogging	<1955-1963	Eglin AFB	5,000 gal/yr 2% spray	1) Empty, unrinsed 55 gallon drums	Scrap metal pile - DPDO Eglin Main Landfills
Chlordane	Termite Control Fire Ant Control	<1955-1975	Termite infested buildings at Eglin AFB	10,000 gal/yr 1% spray	1) Empty, unrinsed 55 gallon drums	Scrap metal pile - DPDO Eglin Main Landfills
Chlordane	Termites only	1978-1981				
Malathion 57% Emulsifiable Concentrate	Lawn Pest Control	1963-1971	Eglin AFB	25,000 gal/yr 2% spray	1) Empty, unrinsed containers	Eglin Main Landfills
95% Malathion	Lawn Pest Control	1971-1981	Eglin AFB	330 gal/yr Undiluted	1) Empty, unrinsed 55 gallon drums	Eglin Main Landfills
Bear (OX) 22	Herbicide	1978-1981	Eglin AFB	1000 lb/yr	1) Boxes rinsed	County Landfill
UNOX	Herbicide	1970-1978	Eglin AFB	1000 lb/yr	1) Boxes rinsed	County Landfill
Fenocil	Herbicide	1977-1981	Eglin AFB	36,438 lb/yr	1) Empty, rinsed drums	Scrap metal pile - DPDO

Other materials used to date include Diazidon, Baygon, Cygon, Sevin and Durban.

TABLE 4.4

PAST PESTICIDE AND HERBICIDE UTILIZATION AT HURLBURT FIELD

Material Used	Purpose	Period of Usage	Area Applied	Quantity	Waste Material[1]	Waste Disposal Practice
Malathion	Mosquito Control	1965-1981	Hurlburt	3000 lbs/yr	Empty small containers	Sanitary Landfills
Chlordane	Termite Control	1940-1981	Housing buildings	2000 gal/yr	Empty small containers	Sanitary Landfills
Diazinon	Insecticide	1958-1981	Houses, food handling areas	100 gal/yr	Empty small containers	Sanitary Landfills
Lindane	Pine Borers	1940-1981	Pine areas	500-600 gal/yr 1%	Empty small containers	Sanitary Landfills
Mirex	Fire Ant Control		Ant mounds	500 lbs/yr	Empty small containers	Sanitary Landfills
Baygon	Roach Control	1974-1981	Buildings	300 gal/yr	Empty small containers	Sanitary Landfills
Sevin	Lawn Pest Control	1974-1981	Lawns, Hurlburt	12000 gal/yr 2% spray	Empty small containers	Sanitary Landfills
Nemagon	Nematodes	<1973-1978	Lawns	39 gal/yr 0.1%	Empty small containers	Saniary Landfills
Dursban	Roach Control	1978-1981	Buildings	360 gal/yr	Empty small containers	Sanitary Landfills
Diquat	Aquatic Weed Control	<1973-1981	Lakes, ponds, ditches at Hurlburt	4 gal/7 yrs	Empty small containers	Sanitary Landfills
Roundup	Herbicide	1976-1981	Powerlines, fence rows	12 gal/yr	Empty small containers	Sanitary Landfills
2-4,5,T	Herbicide	1974-1981	Powerlines, fence rows	50 gal/yr	Empty small containers	Sanitary Landfills
2,4, D	Herbicide	1974-1981	Broadleaf plants, Hurlburt	100 gal/yr	Empty small containers	Sanitary Landfills
Dalapon	Herbicide	1974-1981	Fence rows	200 lb/yr	Empty small containers	Sanitary Landfills
Acti-Dione-Thiram	Fungicide	1979-1981	Golf course	3600 gal/yr	Empty small containers	Sanitary Landfills

(1) All containers have been rinsed three times since required by regulations.

is transferred by pipeline to the TAC Storage Area. JP-5 is used in very small quantities and is purchased, as needed, from the Navy. The JP-8 fuel facility consists of two fuel storage tanks with necessary receiving and issuing areas. MOGAS is received by barge and stored at the main base storage area. Both leaded and unleaded facilities are provided. Approximately 200,000 gallons of diesel fuel storage capacity is also provided at the main base facility. Cryogenic Fluids, including liquid oxygen, nitrogen and helium are received, stored and transferred by the Fuels Management branch. Bulk solvent (PD-680 Stoddard Solvent) is stored in a 50,000 gallon tank after delivery by tank truck. The solvent is used in many areas around the base for aircraft maintenance, degreasing, cleaning and for similar uses in the industrial shops.

All above-ground tanks are diked to hold one and one-half times the capacity of the tank. The dikes are earthen with shell and asphalt cover. The only hazardous wastes generated by the Fuels Management Section would be the result of a spill, or during scheduled cleaning of the tanks. Spills are handled according to the Oil and Hazardous Substance Pollution Contingency Plan AD OPLAN 19-1. The fuel oil tanks are periodically cleaned on scheduled 2 1/2 to 5-year intervals. Until approximately 3-5 years ago, sludges removed from the bottom of tanks during cleaning were air dried and buried just outside the dikes. The potential for migration of contamination from these sites is minimal. The current procedure is to pump the sludge out and send it to DPDO for disposal/resale. In the past, these wastes were sent to landfills.

Duke Field

JP-4 fuel and Mogas is received, stored, and distributed at Duke Field. The total JP-4 storage capacity is approximately 157,000 gallons in diked storage tanks. Several small Mogas storage tanks also exist at Duke Field.

Waste JP-4 fuel is handled at Duke Field primarily for recovery and reuse. After passing specification testing, waste JP-4 fuel is returned to Eglin Main Fuels Section for reuse. If a quantity of waste fuel fails to meet reuse specifications, it is disposed through DPDO at Eglin Main. This practice has been in effect for approximately three years. Prior to this the waste fuel was used for fire training. Little or no sludge waste has been generated from the JP-4 fuel.

Hurlburt Field

The Fuels Management Section receives, stores, and distributes JP-4, No. 2 diesel fuel, and Mogas at Hurlburt Field. The storage capacity is 906,000 gallons for JP-4, 104,000 gallons for No. 2 diesel, and 61,000 gallons for Mogas. Each of the above-ground or partially above-ground tanks is diked.

This section also manages four waste material tanks. An 8,000 gallon slop tank receives waste paint thinners and solvents. Three 6,000 gallon tanks receive reusable JP-4, mixed waste fuels, and waste oils. These tanks have been in use since 1973. A contractor is secured through DPDO, Eglin Main, to empty these tanks on an as-needed basis. Prior to 1973 all waste materials were received by the 8,000 gallon tank with final disposal by a DPDO contractor. The waste tanks are gauged for inventory weekly. No major spills have occurred at this facility.

Pesticide and Herbicide Utilization

Pesticides and herbicides have been used on Eglin AFB to maintain proper control of pest infestations and ground foliage. Historical pest control management practices and usage rates documentation were not available (except for recent years). However, through personnel interviews with entomology section, grounds section, and pest management personnel historical pesticide and herbicide application and waste disposal practices were reviewed.

The major usage of past pesticides and herbicides as well as waste disposal practices are summarized in Table 4.3 for Eglin AFB and in Table 4.4 for Hurlburt Field in particular. Recent storage and disposal practices appear to be well managed and no pollution cases or potential contamination problems can be associated with these practices at Eglin AFB. However, prior to 1975, several potential insecticide storage and disposal practices problem areas have been identified and are discussed below.

1) Empty, unrinsed 55-gallon drums sent to scrap pile at DPDO.
2) Empty, unrinsed or partially rinsed small pesticide containers were landfilled along with sanitary refuse at various landfill locations thoughout Eglin Main and Hurlburt Field. The quantity and content of materials associated with this practice should not present a significant contamination potential.

3) Prior to 1975 pesticide and herbicide container rinsewater was flushed to the sewer system for all insecticides used except DDT and Methoxychlor. Small quantities of these materials might have migrated eventually to Choctawhatchee Bay either through surface discharge or ground-water recharge from the spray areas. These materials are biodegradable and are not a significant contamination potential.

4) Methoxychlor was stored in 55-gallon drums at Building 639 in the old CE storage yard on Eglin Main. Based on personnel interviews, leakage and spillage occurred at this site in the past. A site evaluation will be discussed in a subsequent section on overall past storage and disposal practices which includes the Old CE storage yard.

5) DDT was stored in 55-gallon drums in an uncovered area in the DPDO salvage yard. Leakage and spillage occurred at this site in the past and is discussed in terms of site significance in subsequent sections discussing the DPDO operation.

Demilitarization / Disposal of Conventional Munitions

The demilitarization of conventional munitions is handled by the Explosive Ordnance Disposal (EOD) group under the Directorate of Logistics at Eglin AFB. The technologies used at Eglin for the disposal of obsolete, unsafe, and excess explosives and propellants have been 1) open burning under controlled conditions and 2) open detonation under controlled conditions.

Demilitarization is the process of removing the energetic ingredients contained in munitions which are defective, obsolete, unsafe, or otherwise no longer required in the military inventory. Since 1960 at Eglin essentially all pyrotechnic materials have been demilitarized by burning and all explosives have been detonated. Prior to 1960 most all the conventional munitions were demilitarized by dumping at sea. Other than ocean dumping, open burning is the oldest and most universal demilitarization technique. Basically, the unwanted materials are piled in a designated remote, open field, sufficient starter fuel is added and the waste is ignited. There is no elaborate equipment involved, negligible fuel cost and little labor cost. High-order detonation is also an old and universal disposal method, and is often the only available

method when an item such as a large bomb or shell is so deteriorated or so constructed that there is no safe way to disassemble it.

Burning and detonation sites at Eglin AFB include Test Areas C-52 and C-62. Munitions disposal occurred (Site D11) near Range C-52. The UTM Coordinates for this site are EJ 563830, 3377800.

In addition to residues at the burning and detonation sites, miscellaneous residues and metal scraps from shell casings are present on all active "hot" ranges at Eglin AFB.

The pollution potential from residues of detonated and/or burned conventional munitions is minimal from a toxicity viewpoint. Air pollution consists primarily of fine particulates and, to some extent, nitrogen oxides. Solid waste consists primarily of ash and scrap metal. Essentially, EOD personnel use state-of-the-art technology for demilitarization of conventional munitions and the practices at Eglin AFB present no potential for migration of contaminants off the base.

Hurlburt Field

The only munitions disposal at Hurlburt Field has occurred near the EOD training range (Site D41). The UTM coordinates for this site are EJ 526400, 3365800. This 1-2 acre site was closed for disposal in the late 1970's and had been utilized for a period of approximately 20 years. Napalm bombs, bomb fuses, small arms ammunition, cartridge activated devices, and unknown amounts of bulk explosives were disposed in the early 1950's and 1960's. Trenches were excavated at a minimum of 4 feet deep and munitions were buried, covered with napalm and lit for burning and detonation. According to Hurlburt EOD personnel high water table levels in this vicinity caused the trenches to collapse, resulting in incomplete detonation and napalm burning.

Site Evaluation. The existing site has been covered and closed with local sandy soils. No reseeding has occurred. However, due to the sandy nature of the area soils and high ground-water table, drainage of leachate occurs to the East Bay Swamp area. Leachate was observed during a site visit as well as uncovered small pieces of napalm.

Potential ground-water contamination problems relate to hydrocarbons and nitrates which may be present resulting from the napalm and ammunition, respectively.

Fire Control Training

Three fire training areas exist at Eglin and Hurlburt. These areas have and continue to serve as a practice burning/extinguishing area where petroleum based fires are set and extinguished. The following are specific designations for the individual training areas as well as their UTM Coordinates:

Fire Training Area	UTM Coordinates
Eglin Main	Between Runways
Hurlburt Field	EJ 530340, 3366580
Duke Field (No. 3)	EJ 546325, 3390630

In the past, the common mode of operation was for the Fire Protection Division Department to collect waste fuels, oils, solvents, and contaminated fuel and to utilize this for fire training exercises. In the late 50's and early 60's, this mechanism provided a two-fold purpose: it allowed for fire training (at least two to three times per week) and it disposed of the majority of the flammable petroleum based products generated on the base.

The procedure utilized in the fire training area was to construct an earthen dike approximately 12 to 18 inches high in order to contain the fire, pour the fuel onto the soil within the dike and to set the fuel on fire. Chemicals were then applied to extinguish the fire. As air pollution regulations became more stringent in the mid 60's, the fire training exercises were curtailed severely.

To extinguish a typical fire, the fire department has used a fire control agent, AFFF, that has a chemical oxygen demand approximating 400,000 milligrams per liter (mg/l) in the concentrated form, but 12,000 mg/l to 24,000 mg/l at the dilution ranges used for fire control. AFFF is not a hazardous substance according to RCRA although the COD concentration is quite high.

Due to the locations of the fire training areas and past procedures, no potential off-site contamination migration is

expected from the fire training areas at Eglin Main and Duke field. Based on personnel interviews past spills occurred at the Hurlburt Field location and some materials escaped to a nearby drainage ditch. Visual evidence of past contamination along the edges of the drainage ditch was observed during the site visit. These spills have not occurred recently and do not present a potential for migration of contamination off the base.

Test Ranges

There are three basic categories of waste products associated with the test range activities: Explosives Contamination, Herbicide Orange and Blue Contamination, and Depleted Uranium Contamination. These will be discussed in the following sections.

Explosives Contamination

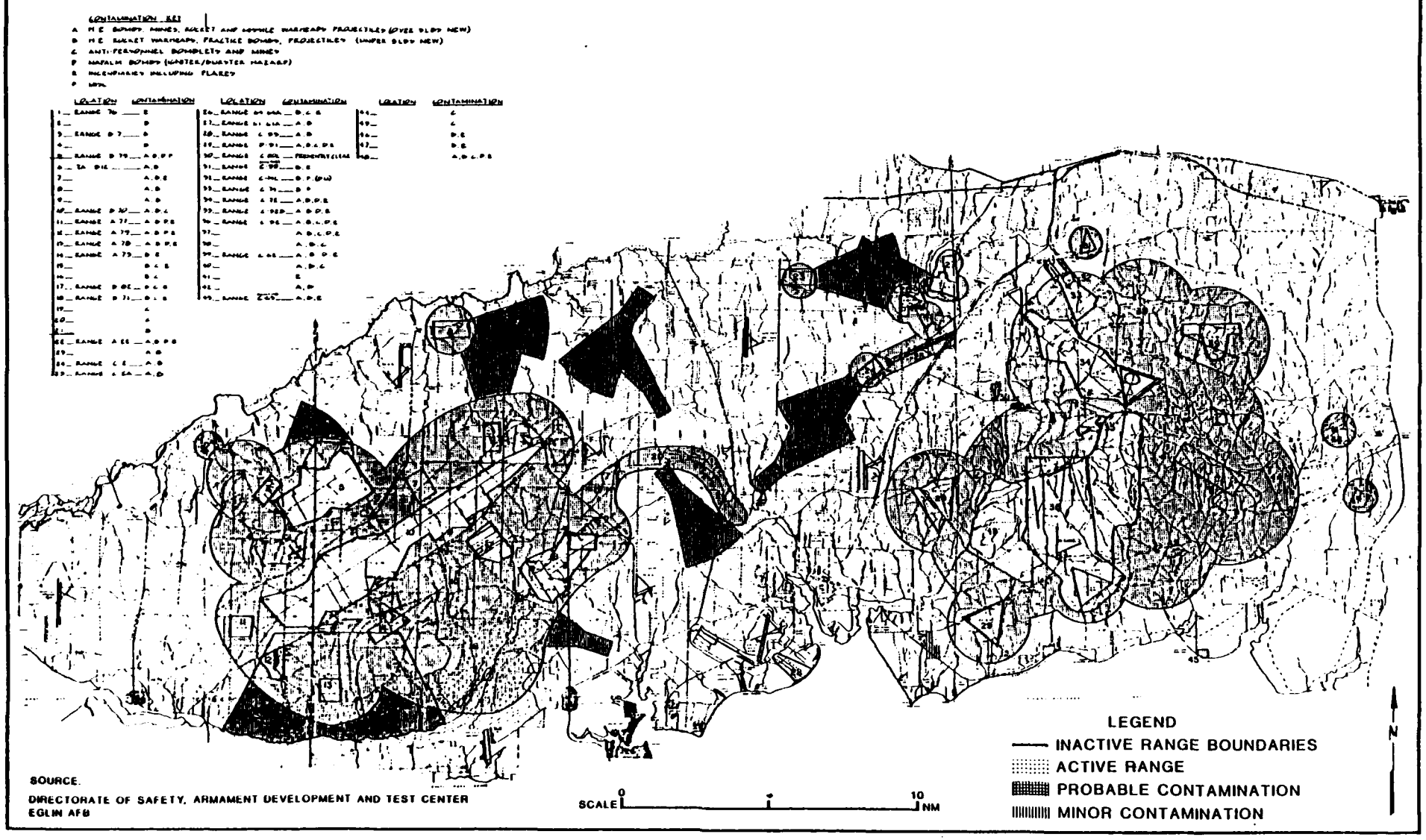
A study was conducted by the Directorate of Safety at Eglin in 1976 to identify areas on the reservation contaminated with explosives. The results of this study and any subsequent studies are limited as the history of munitions expended on the reservation is fragmentary and meager. Many assumptions as to contamination were made by indicators such as bomb craters shown in old photographs. A basic assumption made in the 1976 study was that all areas that have experienced air delivered ordnance were assumed to contain subsurface contamination in the form of unexploded ordnance. Figure 4.2 presents the results of the 1976 study. The study is presented below.

Approximately 330 square miles of the reservation contains various known and unknown types of explosive munitions. Present ordnance locating devices are not sufficiently reliable to detect underground munitions when the depth exceeds 18 inches, nor are they suitable for wide area search in rough, swampy or forested terrain. In addition, decontamination is limited by such factors as prohibitive costs and available Explosive Ordnance Disposal (EOD) manpower for vast area surface clearance. Because clearance of all contamination cannot be performed, the AD has established the following requirement. All test directives which require construction or ordnance recovery within an explosives contaminated area are reviewed by the Deputy for Safety for a site determination. For example, Test Areas C-52 N, E and W are so densely contaminated with subsurface unexploded ordnance that excavation has

FIGURE 4.2

EGLIN AFB

EXPLOSIVE CONTAMINATION MAP



SOURCE:
DIRECTORATE OF SAFETY, ARMAMENT DEVELOPMENT AND TEST CENTER
EGLIN AFB

ES ENGINEERING-SCIENCE

been prohibited. All other test ranges require evaluation on a case-by-case basis to determine if the proposed operations can be performed with acceptable risks.

Herbicide Associated Contamination

Between 1962 and 1970 herbicide application dissemination systems were tested at Eglin Air Force Base. Potential problem areas have been identified relating to the application of Herbicide Orange and Herbicide Blue. Herbicide orange dissemination and its associated TCDD (2, 3, 7, 8 tetrachlorodibenzo-P-dioxin) contamination has been studied extensively by the Air Force as referenced by the documents listed below. On-going investigations concerning herbicide orange are being conducted under the title of "Environmental Chemistry of Herbicide Orange."

1. Defoliant History of Test Area C-52A, Working Papers, Vitro Corporation of America and Armament Development and Test Center, December, 1969.

2. Military Herbicides and Insecticides, AFATL-TN-70-1.

3. A Historical Study of Yucca Filamentosa L. From Test Area C-52A, Eglin Reservation, Florida, AFATL-TR-70-125.

4. Supplement to Working Papers on Defoliant History of Test Area C-52-A, Air Force Armament Laboratory, March, 1971.

5. Annual Diameter Growth of Conifers Adjacent to Eglin ReservationTest Area C-52A as Related to the Testing of Defoliant Spray Equipment, AFATL-TR-71-52.

6. Insect Density and Diversity Studies on Test Area C-52A, Eglin AFB Reservation, Florida, AFATL-TN-72-4.

7. Vegetative Succession Studies on a Defoliant - Equipment Test Area, AFATL-TR-72-31.

8. Animal Survey Studies of Test Area C-52A, Eglin AFB Reservation, Florida, AFATL-TR-72-72.

9. Ecological Studies on a Herbicide - Equipment Test Area (TA C-52A), Eglin AFB Reservation, Florida, AFATL-TR-74-12.

10. A Survey of Trees on a Herbicide Treated Test Area, Eglin AFB, AFATL-TR-74-190.

11. Field Studies of Wildlife Exposed to TCDD Contaminated Soils, AFATL-TR-75-49.

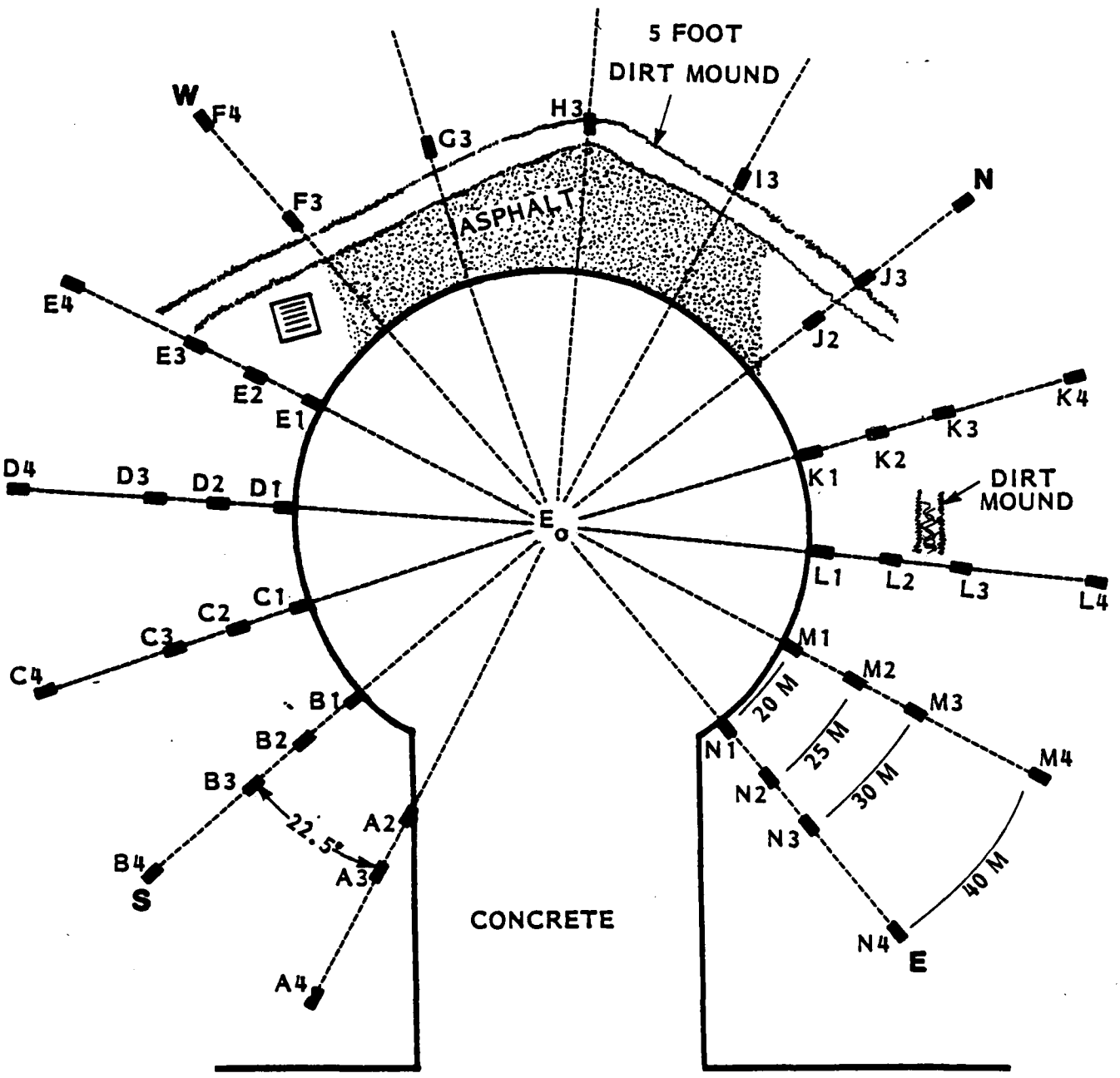
12. Studies of the Ecological Impact of Repetitive Aerial Applications of Herbicides on the Ecosystem of Test Area C-52A, Eglin AFB, Florida, AFATL-TR-75-142.
13. Fate of 2,3,7,8-Tetrachlorodibenzo-P-Dioxin (TCDD) in the Environment: Summary of Decontamination Recommendations, USAFA-TR-76-18.
14. The Toxicology, Environmental Fate, and Human Risk of Herbicide Orange and its Associated Dioxin, OEHL TR-78-92.
15. Residual Levels of 2,3,7,8-Tetrachlorodibenzo-P-Dioxin (TCDD) Near Herbicide Storage and Loading Areas at Eglin AFB, Florida, AFATL-TR-79-20.

From June 1962 to October 1970 a total of 4,394 gallons of Herbicide Blue was disseminated at Eglin Air Force Base on Test Range C-52A. The loading of herbicides onto the aircraft occurred at Hardstand 7 and Hardstand 8. Hardstand 7 was the principal aircraft loading area. This Herbicide Blue contained 13,624 pounds of active ingredients comprised of cacodylic acid and sodium cacodylate. Cacodylic acid and its sodium salt (sodium cacodylate) contains pentavalent arsenic (A_s^{+5}).

Hardstand 7. Hardstand 7 is an asphalt and concrete aircraft parking area located west of the North-South runway on the Main Eglin Base connected to the runway by an asphalt taxiway. The soil around the perimeter of Hardstand 7 is classified as medium to fine sand and silt with moderate permeability. Directly behind the hardstand is a ravine that drops off approximately 45 feet to a small pond. The pond drains into a small stream which flows north until it enters a man-made reservoir named Beaver Pond. The drainage system eventually flows into Tom's Bayou and Choctawhatchee Bay. Herbicide aircraft loading, unloading and drum storage took place at the Hardstand 7 area during the dissemination test program. For a more detailed discussion of site characteristics see the Air Force Report AFATL-TR-79-20.

Arsenic contamination from Herbicide Blue loading operations have been identified on Hardstand 7. Figure 4.3 and Table 4.5 illustrate the levels of arsenic contamination which have been documented. Figure 4.3 is the soil sample grid key. Soil samples were collected at the various point at depths of 0-10 cm, 20-30 cm, 55-70 cm and 95-110 cm. Table 4.5

HARDSTAND 7 SOIL SAMPLE GRID



SOURCE: AFATL-TR-79-20

TABLE 4.5

MEAN TOTAL ARSENIC CONCENTRATIONS FOR HARDSTAND 7 SOIL SAMPLES

Sample Site	Total Arsenic Mean (ppm)	Sample Site	Total Arsenic Mean (ppm)	Sample Site	Total Arsenic Mean (ppm)
A-2		D-1		F-3	
1	11.4	1	274	1	2.3
2	18.8	2	151	2	3.5
3	21.0	3	138	3	4.0
		4	137		
A-3				F-4	
1	11.8	D-2		1	7.3
2	8.2	1	12.8		
3	18.2	2	37.6	G-3	
		3	6.2	1	8.1
A-4				2	8.1
1	12.8	D-3		3	8.8
		1	88.2		
B-1		2	68.5	H-3	
1	237	3	54.0	1	8.8
2	521			2	13.4
3	459	D-4		3	19.5
		1	4.6		
B-2				I-3	
1	7.9	E-0		1	1.1
2	5.3	1	1087	2	22.4
3	5.8			3	21.6
		E-1			
B-3		1	9.7	J-2	
1	78.0	2	11.0	1	86.4
2	171	3	9.6	2	12.6
3	22.4	4	12.0	3	15.5
C-1		E-2		J-3	
1	204	1	13.1	1	5.7
2	298	2	14.2	2	5.7
3	368	3	5.9	3	5.5
C-2		E-3		J-4	
1	66.3	1	4.4	1	4.3
2	86.1	2	5.9		
3	102	3	18.8	K-1	
				1	12.2
C-3		E-4		2	6.6
1	12.8	1	14.4	3	8.2
2	88.0			4	6.5
3	114	F-2			
		3	4.2	K-2	
C-4				1	404
1	8.0			2	143

TABLE 4.5 (CONTINUED)

MEAN TOTAL ARSENIC CONCENTRATIONS FOR HARDSTAND 7 SOIL SAMPLES

Sample Site	Total Arsenic Mean (ppm)	Sample Site	Total Arsenic Mean (ppm)
K-3		M-2	
1	8.1	1	5.6
2	8.1	2	11.0
3	5.1	3	8.2
K-4		M-3	
1	3.1	1	4.2
		2	9.6
L-1		3	12.0
1	90.7		
2	471	M-4	
3	93.8	1	13.1
L-2		N-1	
1	170	1	150
2	128	2	213
3	117	3	194
L-3		N-2	
1	4.6	1	46.3
2	10.0	2	58.6
3	29.2	3	160
L-4		N-3	
1	4.8	1	9.1
		2	31.2
M-1			
1	7.0	N-4	
2	13.7	1	10.3
3	145		

Note:

Sample Designation

1 - 0-10 cm soil depth
2 - 20-30 cm soil depth
3 - 55-70 cm soil depth
4 - 95-110 cm soil depth

contains the mean total arsenic concentrations determined by the Air Force at those locations.

According to the Merck Index of Chemicals and Drugs (8th Edition) cacodylic acid is soluble in water. Whether or not the cacodylic acid or sodium cacodylate breaks down into a soluble or insoluble form of arsenic has not been determined at Eglin. Therefore, the potential routes of migration are based upon the solubility of cacodylic acid and are identified below:

- vertical soil migration
- soil erosion (lateral migration)
- sediment transport (lateral migration)
- biological uptake and transport

Some evidence exists to suggest that some vertical, arsenic migration has occurred at Hardstand 7. No other evidence exists which can be used to evaluate the other potential routes of arsenic migration at this site.

Based on site proximity to ground and surface waters and the possible pathways of migration, a potential exists for off-base contamination migration at Hardstand 7 via ground water and Tom's Bayou (surface water and/or sediment transport). The potential for biological contamination and subsequent migration has not been investigated.

C-52A Test Range. Herbicide Blue dissemination occurred on the one square mile test grid located inside C-52A. Test range C-52A is located in the southeastern part of the Eglin Reservation and covers an area of approximately 3 square miles.

The soil at C-52A is for the most part a fine white sand on the surface changing to yellow sand beneath. The soils of the range are predominantly well drained acid sands of the Lakeland Association with 0 to 3 percent slope. Directly west and southwest of C-52A is Mullet Creek. The headwaters of Trout Creek originate in the northeast corner of C-52A and flow south. North of C-52A is Basin Creek. The water table is high and estimated to be at a depth of 5 feet or less.

Arsenic contamination from Herbicide Blue dissemination operations has been identified at Range C-52A. A study by the Air Force in June

and July of 1978 determined total arsenic concentrations at various locations within the test grid located at the C-52A test range. The concentrations range from 0.487 ppm to 3.608 ppm in the 0" to 8" core samples and from 0.212 ppm to 4.141 ppm in the 8" to 16" core samples. The study concluded the following:

- Arsenic sprayed in one area could possibly have been blown to another.
- Leaching (vertical migration) from the 0" to 8" cover to 8" to 16" core samples may have occurred.

The source of this information is "Working Paper; Determination of Arsenic Concentration of Soil Samples from Test Area C-52A, AFATL/DLV."

Some evidence exists to suggest that some vertical, arsenic migration has occurred at Range C-52A. No other evidence exists which can be used to evaluate the other potential routes of arsenic migration at this site.

Based on site proximity to ground water, a potential exists for offbase contamination migration at C-52A via ground water and Mullet Creek. The potential for biological contamination and subsequent migration has not been investigated.

Depleted Uranium (DU) Operations

The DU testing operations at Eglin AFB are conducted under a U.S. Nuclear Regulatory Commission (NRC) License (No. SUB 992) at Range C-64 and C-74L. Based upon the record search, interviews, observations and Nuclear Regulatory Commission Inspection Reports (most recent report reviewed dated July 11, 1980) no items of non-compliance or unsafe conditions were found. The operation at Range C-64 is well controlled, security is adequate, and acceptable safety precautions and practices are being used. The clean-up operation for deactivation of site C-74L was well planned and is in advanced stages of implementation.

OVERALL SOLID WASTE DISPOSAL OPERATIONS

A variety of residential, commercial and industrial refuse is generated and disposed on Eglin Air Force Base due to the diversity of installation operations at the site. Table 4.6 contains a categorical summary of the types of solid waste generated at the site as well as the recent and historical methods of waste handling and disposal. Solid

TABLE 4.6

EGLIN AFB SOLID WASTE CATEGORIES AND TYPICAL DISPOSAL PRACTICES

Type of Waste	Recent Disposal Method	Typical Historical Disposal Method
Construction debris	Hardfill/Sanitary landfill	Hardfill/Sanitary Landfill
Runway debris	Hardfill/Sanitary landfill	Hardfill/Sanitary Landfill
Building materials	Hardfill/Sanitary landfill	Hardfill/Sanitary Landfill
Metal scrap	Hardfill/Sanitary landfill/DPDO	Hardfill/Sanitary Landfill
Masonry debris	Hardfill/Sanitary landfill	Hardfill/Sanitary Landfill
Empty containers (drums, metal cans, plastics)	Sanitary landfill	Sanitary Landfill/Drum Disposal Area
Batteries, rubber, other garbage	Sanitary landfill	Hardfill/Sanitary Landfill
Scrap paper, cardboard	Local recycler/sanitary landfill	Sanitary Landfill
Animal and vegetable wastes	Local farmers	Sanitary Landfill
Pathological waste	Incinerator	Incinerator
Waste fuels and petroleum products		
Synthetic engine oils	DPDO	Sanitary Landfill/Drum Disposal Area
Mineral engine oils	DPDO	Sanitary Landfill/Drum Disposal Area
Hydraulic Fluid-Mineral base	DPDO	Sanitary Landfill/Drum Disposal Area
Hydraulic fluid-Synthetic base	DPDO	Sanitary Landfill/Drum Disposal Area
Jet Fuel	DPDO	Sanitary Landfill/Drum Disposal Area
Aviation gasoline	DPDO	Sanitary Landfill/Drum Disposal Area
Halogenated solvents	DPDO	Sanitary Landfill/Drum Disposal Area
PCB transformers	DPDO	Sanitary Landfill
PCB capacitors	DPDO	Sanitary Landfill
Waste pesticides/herbicides	DPDO	Sanitary Landfill/Drum Disposal Area
Herbicide drums		Drum Disposal Area
Shop waste	DPDO	Sanitary Landfill/Hardfill/Drum Disposal areas
Waste treatment plant sludge	Landspreading Eglin AFB	Landspreading Eglin AFB
Waste treatment plant grit	Sanitary Landfill	Sanitary Landfill
Spent laboratory glassware, towels	Sanitary landfill	Hardfill/Sanitary Landfill
Scrap lumber	DPDO	Hardfill/Sanitary Landfill/open burning
Scrap equipment	DPDO	Hardfill/Sanitary Landfill
Refrigerators	DPDO	Hardfill/Sanitary Landfill
Ovens	DPDO	Hardfill/Sanitary Landfill
Piping	DPDO	Hardfill/Sanitary Landfill
Jeeps	DPDO	Hardfill/Sanitary Landfill
Motors	DPDO	Hardfill/Sanitary Landfill
Miscellaneous parts	DPDO	Hardfill/Sanitary Landfill
Explosives	Per T O 11-A-142	Munitions Disposal Area
Air/Water separator sludges	Contractor	Sanitary Landfill/Drum Disposal Area
Asbestos insulation wastes	Sanitary Landfill	Sanitary Landfill

Note: Drum Disposal Area: Eglin or Hurlburt field area landfill which contained empty or partially full drums of waste materials.

waste materials which are currently landfilled such as runway debris, unsalvageable scrap building materials, empty drums, rubbish, etc. are currently disposed at either of the county landfills at Valparaiso-Niceville and Wright. Waste fuels and petroleum products such as synthetic engine oils, mineral engine oils, hydraulic fluid-mineral base, hydraulic fluid-synthetic base, jet fuels, and halogenated solvents etc. from Hurlburt, Eglin, Tyndall and the Panama City naval facility are processed through the Defense Property Disposal Office (DPDO) for sale to a contractor. Scrap metals, lumber and other salvageable parts are processed through DPDO for sale to outside organizations and activities. Excess scrap lumber was disposed of by open burning. Scrap cardboard from the Base Exchange and Commissary is baled and sold to local contractors. Edible scraps from the base dining areas are sold to local farmers. Pathological waste from the base hospital is incinerated.

All active and inactive storage, disposal and waste treatment sites are listed in Tables D.2 and D.3 of Appendix D. Storage, disposal, waste treatment site descriptions, disposal practices, and subsequent potential site contamination problems are discussed in subsequent sections.

Active Storage and Disposal Sites

Active solid waste storage and disposal sites are illustrated in Table 4.7. These sites are all located on the Base Maps illustrated in Appendix E. An assessment of each sites' potential for contamination migration is presented below along with a summary of wastes deposited and key site inspection observations.

Niceville-Valparaiso Landfill (Site D18)

Site Description. A 20-acre plot of Eglin Air Force Base land about a half mile west of State Road 85 and just south of the USAF railroad is currently utilized as a county-operated landfill for the cities of Niceville and Valparaiso, Florida. This site has been used since 1979 as a sanitary landfill for the Eglin Air Force Main Base. The site is located on nearly level land on a ridge that slopes rather

TABLE 4.7

ACTIVE SOLID WASTE STORAGE AND DISPOSAL SITES ON EGLIN AFB

Site	Site Name	UTM Coordinate Location	Period of Operation*	Area Size (Acres)	Suspected Types of Wastes	Estimated Quantity of Waste (Acre-Ft)	Method of Operation	Closure Status	Geological Setting	Surface Drainage	Evident and Potential Problems
EGLIN MAIN AREAS											
D18	Niceville - Valparaiso Landfill	EJ 547260 3379450	1979-1981	20	Runway debris, unsalvageable scrap, building materials, empty non-hazardous drums, rubbish, dead animals	Unknown	Trench method - 6' trenches	Active site operated by County	Level land, sandy soils to 25-30' depth underlain by 6'-8' of red or white clay. Permanent water table 50' below surface, perched water tables exist	Slopes steeply to streams on north, west and south which ultimately drain to Choctawhatchee Bay	• Highly permeable soils • Not operated according to plans • Some trenches unlined • CDD contamination in monitoring wells
D37	Wright Landfill	EJ 535940 3370730	1979-1981	160	Runway debris, unsalvageable scrap, building materials, empty non-hazardous drums, rubbish, dead animals	Unknown	Trench method-14' deep trenches, surface water perimeter ditch	Active site operated by County	Level land, deep sandy lakeland soils, water table 20'-25' below surface	Surrounded by perimeter ditch and cattail marsh. Drainage to East Bay Swamp	• Operation in water table at some instances in the past • Highly permeable soils • CDD contamination exists in monitoring wells • Unlined
D25	Holley Landfill	EJ 512050 3368850	Not used for Eglin or Hurlburt field wastes	10	Municipal refuse from community of Holley and Southern Santa Rose County	Unknown	Ramp method in past USAF borrow pit-15'pit depth	Active site operated by County	Level land, sandy loam and sandy clay loam soils, red clay at 14-27' below intact land - water table at 60-75' below ground surface	Surface runoff to pond-marsh ecosystem	• None
S2	Defense Property and Disposal Office (DPDO) Storage	EJ 548080 3371500	1949-1981	10	DDT drums, waste fuel oils/solvents (synthetic oils, mineral oils, jet fuel, halogenated and non-halogenated solvents) PCB Transformers	36-40, 55 gal. drums stored, unknown leakage, unknown spillage Unknown leakage	Storage facility	Active	Sandy soil on level land covered by oyster shells, groundwater depth 4-6'	Surface drainage to perimeter ditch	• Highly permeable soils • Past DDT drum leakage at site • Past waste POL tank spillage • Past PCB transformer leakage
S3	CE Storage Yard	EJ 548700 3371430	1960's-1981	40'X40'	Pesticide Storage Known (Nemagon)	Unknown	Storage Facility	Active	Wooden building on sandy, silty soils with substantial erosion evident on southeast corner of lot	Runoff drains about 40' to drainage ditch	• Surface erosion and highly permeable soils • Proximity to drainage ditch • Soil stains in vicinity of building • Rusty nature of drums
HURLBURT FIELD AREAS											
S5	Hurlburt PCB Storage Building	EJ 529175 3364875	1980-1981	16'X20'	PCB Oil Drums	1320 gal (stored)	Storage Facility	Active	Concrete lined, metal building situated on sandy soils	N.A.	• None

* Eglin AFB usage
N.A. Not Applicable

steeply down to streams on the north, west and south. The soils at the site are deep, porous, and sandy soils to depths of 25-30 feet. A 6-foot to 8-foot thick layer of red or white clay generally is located under these sands. The permanent water table is fifty feet below the land surface. Temporary, perched water tables, present during the rainy season, occur at depths ranging from 25-50 feet below the land surface. This site was recently permitted by the FDER (No. S046-26613) as a sanitary landfill for residential, agricultural, municipal and some commercial waste materials. As with other landfill sites in the State of Florida, hazardous or toxic waste materials are not permitted for landfill disposal.

Waste Disposal Practices. Table 4.7 illustrates the types of solid wastes generated at Eglin Main Base which are currently disposed at the Valparaiso-Niceville Landfill. In addition to these wastes typical municipal refuse generated at Valparaiso and Niceville is disposed at the site. Based on a review of site operating plans and discussions with Florida FDEC personnel, the following key observations are presented:

1) Operating method: the Valparaiso-Niceville landfill is operated according to the trench method (6 foot trench depths).

2) Liner details: the bottom of each trench is lined with a 1-foot compacted soil layer as required for a leachate barrier.

3) Lift placement and cover: waste material is placed in 6-foot lifts in the trenches, compacted and finally covered with a 1-foot layer of soil cover.

4) Trench plans: the site is segregated into eight trench areas. One trench area is subdivided into designated sections for dead animals, white goods, bulky wastes and hazardous wastes.

5) Leachate barrier: A retention pond on the south side of the landfill collects contaminated surface runoff and lateral seepage.

6) The FDER has conducted a partial review of the Valapraiso-Niceville Landfill with respect to the "open dump" criteria. The site is considered a sanitary landfill with respect to the partial review; however, an assessment of ground-water quality monitoring data has not been initiated.

Site Evaluation. Visual observations during a field visit to the site indicated that the site was not being operated according to plan procedures as noted by the following observations:

1) Active trench - a 1-foot compacted liner of suitable clay material to prevent leachate migration was not present in the active municipal refuse trench nor in a recently excavated trench containing two empty drums.

2) Intermediate daily cover was not evident on the previous day's waste fill.

A review of existing monitoring well data (4 wells) indicates that contamination presently exists at two downgradient wells as evidenced by chemical oxygen demand (COD) concentrations of 44 mg/l to 443 mg/l for the wells during specific sample periods from 1977 to 1980 at the existing monitoring well locations.

Wright Landfill (Site D37)

Site Description. A 160-acre tract of land on Eglin AFB about 1 1/4 miles north of S.R. 189 is currently used as a county-operated landfill area for the City of Wright, Florida and since 1979 has been permitted for use by Hurlburt Field, Eglin Main housing and all Okaloosa County south of Eglin Main. This site is located on nearly level land which slopes gently to the west and drains into the East Bay Swamp system. The soils are of deep sandy Lakeland series with the water table fluctuating between 20 to 25 feet below the normal soil surface. No clay or clay-like subsoils suited to impeding leachate are located in the landfill area.

The site is permitted by the FDER (No. S046-0012) as a sanitary landfill for residential, agricultural, municipal and some commercial waste materials. As with other landfill sites in Florida, hazardous or toxic waste materials are not permitted for landfill disposal.

Waste Disposal Practices. The solid wastes generated at Hurlburt Field are currently disposed at this landfill. The types of solid wastes are similar to the wastes from Eglin Main which are illustrated in Table 4.7. Based on a review of site operating plans, a field inspection, and discussions with Florida DER personnel, the following key facts and observations are offered concerning the landfill site:

1) Liner details: the landfill is unlined.
2) Operating method: the basic method of operation is the trench method (14 foot trench depths). Solid wastes are trenched and compacted to a depth of 3 feet. 1 foot of sandy soil is compacted and utilized as cover material.
3) Surface runoff waters are contained by a perimeter ditch around the entire site. The ditch is surrounded by a fringe of cattail marsh. This ditch contains most surface runoff and some lateral leachate migration. However, vertical migration of leachate is not restricted.
4) The FDER has conducted a partial review of the Wright Landfill with respect to the "open dump" criteria. The site is considered a sanitary landfill based on this partial review; however, an assessment of ground-water quality monitoring data has not been initiated.

Site Evaluation. Trench operation is generally above the water table, but instances have occurred where trenches were excavated below ground-water level and filled with refuse. A review of existing monitoring well data for six wells indicates that contamination has existed during the period of 1977-1980 as evidenced by COD concentrations ranging from 25 mg/l-998 mg/l for the wells.

Holley Landfill (Site D25)

Site Description. Portions of a 160-acre plot of Eglin AFB land located northeast of Holley Community in Section 32, Township 1 South, Range 26 west about 1/2 mile north of State Highway No. 87 are currently being used as a permitted sanitary landfill for the Community of Holley and Southern Santa Rosa County. The portion currently utilized is a 10-acre area within a borrow pit previously used by the Air Force. The borrow pit site is located on nearly level land approximately 15 feet in depth with minimal surface runoff. The soils consist of sandy loam and

sandy clay loam. Approximately 1 foot of sandy clay loam separates the borrow pit bottom from a more pervious sandy loam. Throughout the remainder of the site a red clay layer exists from 14 feet to 27 feet below the surface of intact lands. Loose fine to medium sands are located below the red "clay" horizon to indefinite depths. The water table is generally located between 60 to 75 feet below the normal surface.

The site has been permitted as a sanitary landfill by the FDER for residential, agricultural, municipal and some commercial waste materials. No hazardous or toxic wastes are permitted for disposal at this site.

Waste Disposal Practices. Wastes from the Eglin AFB and Hurlburt Field are not disposed at the Holley Landfill. The wastes disposed at this site are typical of municipal refuse, i.e. corrugated paper boxes, newspapers, brown paper, planter cartons, plastics, food, wood, leaves, grass, rags, rubber, leather goods, dirt, metals, glass, etc. Based on a review of site operating plans, a field visit and discussions with FDER personnel the following key observations are presented:

1) Operating method: the ramp method of landfill operation is utilized to compact wastes into 3-foot layers with 1 foot of cover.
2) Liner details: the existing red clay pit liner is utilized to prevent vertical leachate migration.
3) Cover material: final cover material is 3 to 4 feet of heavy-red "clay" with columns of gravel to vent waste decomposition gases.
4) Leachate control: leachate ponds are located at the lowest elevation downslope of the site to collect lateral seepage.
5) Surface runoff: surface runoff is diverted to pond-marsh ecosystem developed in and around the leachate ponds.

Site Evaluation. Existing monitoring well data is not sufficient to assess ground-water contamination. However, due to the existing operation procedures and site characteristics none should be expected.

Defense Property and Disposal Office (DPDO) (Site S2)

Solid wastes are screened for salvageable materials which may then be redistributed into national supplies through the DPDO on Eglin AFB. The DPDO site is located on a level 10-acre plot of land with oyster shell surface on Eglin Main. As illustrated in Table 4.6, a variety of salvageable materials are delivered to DPDO. Waste materials of concern from a handling, storage and ultimate disposal standpoint include the following:

- DDT drums
- Waste fuel oils/solvents (synthethic oils, mineral oils, jet fuel, halogenated and non-halogenated solvents)
- 700-800 empty drums (ethylene glycol, cleaning solvents, engine oils, etc.)
- PCB transformers/capacitors

Due to the presence of these materials the DPDO storage area was submitted as a hazardous waste storage facility under the Eglin AFB RCRA Permit A application.

Based on DPDO facility records and a site inspection, the following key observations appear pertinent to this evalaution:

1) The storage yard is surrounded by a 6-14 foot fence to ensure adequate security under RCRA interim status requirements.
2) The salvage yard is segregated into various plots for specific salvage materials such as refrigerators, tires, old trucks, tanks, scrap pipe, empty drums, etc.
3) Potential for migration of salvage yard spills through the ditches to a creek on the southwest side of the yard exists.
4) Area 16 currently is not used for storage, however, leaky transformers were stored here in the past for a period of about 10 years. Based on personnel interviews, some of the transformers may have contained PCB's.
5) An unlined lot was used during 1980 as a storage site for 36-40 55-gallon DDT drums. These drums were moved in the fall of 1980 to a new DDT storage building near Building 518 on the west side of the yard. The soils at the site were contaminated with DDT resulting from drum leakage and spillage. An odor was evident during the site inspection at this location.

6) Prior to 1980, a 10,000-gallon underground tank was utilized for waste fuel oil/solvents storage in the vicinity of the present waste fuel/solvent segregation and storage area. Based on historical photographs and personnel interviews spillage of these materials occurred in the areas adjacent to the tank. This area currently contains six storage tanks and is paved with asphalt base.

Site Evaluation . Due to the nature of the wastes spilled at the DPDO storage yard in the past (i.e., DDT, PCB transformer oils and waste solvents) and the geologic setting (sands, highly permeable soils and high ground-water table, 4-5' depth), the potential for ground-water contamination exists.

CE Storage Yard Storage Building (Site S3)

A small building exists in the southwest corner of the CE storage yard near the Main Base waste treatment plant which has historically contained pesticides. This fenced site (about 40' x 40') is situated on sandy, silty soil with substantial surface erosion evident in the southwestern corner of the building site. Surface drainage is to a nearby drainage ditch which eventually drains to Choctawhatchee Bay.

Site Evaluation. In the past various pesticides have been stored in this area including Nemagon. During the site visit several half-full rusty drums were observed stored in this area. According to one personnel interview the material contained in the drum was probably a pesticide. Visual evidence of soil contamination existed in the area. Due to proximity of the site to the drainage ditch (about 40') and local soil conditions any spillage is likely to drain ultimately to the ditch.

Hurlburt PCB Storage Building (Site S5)

Building 90118 at Hurlburt has been used for storage of 55-gallon drums of PCB oils. 1320 gallons of PCB oils are contained in a 16' x 20' area. The existing building is adequately constructed to contain the PCB drums and no spills or resulting contamination is known. Past practice at Hurlburt indicates that contractors hauled oil PCB transformers off site.

Inactive Solid Waste Storage and Disposal Sites

Prior to 1978 the majority of all solid wastes at Eglin and Hurlburt Field were disposed on currently inactive sanitary landfill sites, drum burial sites and hardfill areas located on either Eglin or Hurlburt. In the past less emphasis was placed on recycling materials and many of the materials currently salvaged through DPDO were disposed in either hardfill, sanitary landfill or drum burial areas. As an overview, Table 4.6 illustrates the various categories of solid wastes generated in the past at Eglin AFB as well as the material's typical disposal area. This table is not a strict categorization of wastes and ultimate disposition. For example, certain sanitary landfill areas on-site contain both hardfill and solvent/oil type wastes.

Based on interviews with key personnel involved in solid waste handling and disposal operations during the past 30-40 years at Eglin AFB and Hurlburt Field, site visits to all disposal locations and a review of existing records information, all past sanitary landfill, hardfill and drum disposal sites were located and assessed with respect to the following:

- Operating procedures
- Site waste inventory
- Closure procedures
- Existing water quality data (surface and ground water)
- Visual evidence of contamination

It should be emphasized that the vast majority of this information was derived from personnel interviews and site visits. Minimal recorded information exists concerning parameters of interest for past sites.

In general, landfills are located at most airfields throughout the base as well as at Eglin Main and Hurlburt Field. Many fill areas were used during specific operations such as "Bold Eagle" as depositories for trash and were operated inefficiently in terms of daily cover and method of fill. No special liners are known to exist at any of the disposal areas located on site. Several of the main landfill areas have been closed with 18" to 48" of final cover and planted with vines or grasses. Some sites have not been adequately closed as determined through our field inspections.

Table 4.8 is a summary of inactive disposal locations as well as a brief description of the type of landfill, wastes deposited, and key site inspection observations. Those sites are listed in Tables D.2 and D.3 of Appendix D and are all located on the Base Maps illustrated in Appendix E. An assessment of Eglin, Duke and Hurlburt sites' potential for contamination is presented below.

Eglin

Many inactive storage and disposal sites on Eglin Reservation are not considered a potential for contamination or migration of contamination due to the innocuous nature of wastes deposited, the remoteness of the site location, and proximity to ground water or surface waters. Many sites located at the field locations contained only hardfill (construction debris, runway debris, etc.) and are not considered a problem. For the above reasons, the following sites present no potential for contamination at Eglin:

- Site D6 - End of Runway 01 Hardfill Site
- Site D8 - CB Lab Landfill
- Site D10 - C-52 - Drum Disposal Area
- Site D12 - C-80C - Hardfill
- Site D13 - Old Field No. 1 Landfill
- Site D16 - Field No. 2 East Sanitary Landfill
- Site D19 - Duke Field Sanitary Landfill
- Site D20 - Duke Field Hardfill
- Site D21 - Old Field No. 5 Sanitary Landfill
- Site D22 - Field No. 6 Sanitary Landfill
- Site D24 - Old Field No. 7 Landfill
- Site D38 - Field No. 4 Landfill

Other sites at Eglin which present no potential for contamination or off-site migration of contamination include the Isotope Burial Area (Site D14), the Wolf Creek Disposal Site (Site D23), the Old CE Equipment Storage Yard (Site S1), and the Empty Drum Storage Area (Site S4). The C-52 Drum Disposal Area contains approximately 60 compacted, empty, solvent-rinsed, 55-gallon Herbicide Orange drums landfilled in 1973. Since the drums were sufficiently decontaminated and the site is remote, no potential problems exist. At the Isotope Burial Area (Site D14), during a test project in 1960, 155 millicuries of zinc-65 were

TABLE 4.8

INACTIVE EGLIN AFB SOLID WASTE STORAGE AND DISPOSAL SITES

Site	Site Name	UTM Coordinate Location	Period of Operation	Area Size (Acres)	Suspected Types of Wastes	Estimated Quantity of Waste (Acre-Ft)	Method of Operation	Closure Status	Geological Setting	Surface Drainage	Evident and Potential Problems
EGLIN MAIN AREAS											
D1	Eglin Main Base Landfill	EJ 549350 3370600	1940's - early '60's	100	Construction rubble, tires, wire, hydraulic fuels, waste oils, waste solvents, septic tank sludges, general refuse, sanitary wastes, PCB capacitors, pesticide containers and pesticides	1000	Trench method - 10-12' trenches with daily cover of 1'. Operated in water table. Sludges and liquids in separate pits.	Landfill inactive 4-5 ' local soil cover - plant and tree growth	Sandy Soils Groundwater table <12' depth	To Choctawhatchee Bay	• Highly permeable soils • Potential groundwater contamination due to high water table and liquid/solvent wastes • No visual evidence of contamination.
D2	Eglin Main Base Landfill Near Commissary	EJ 545400 3369900	Early '60's - 72-73	50	Construction rubble, tires, wood, hydraulic fuels, septic tank sludges, garbage, hardfill, waste solvents, general refuse, PCB capacitors, waste fuel oil, pesticide containers, pesticides, metal plating sludges	200-350	Trench method - 6-7' trenches with daily cover of 2-3'. Did not operate in water table. Septic tank sludges and liquids in separate pits.	Landfill inactive 4-5 ' local soil cover - reseeded with pines, grasses	Sandy Soils	To Choctawhatchee Bay	• Highly permeable soils • Potential groundwater contamination due to permeable soils and cover material through vertical seepage • No visual evidence of contamination
D3	Eglin Main Base Landfill Near Andy's Overrun	EJ 548000 3370700	1972-73 - 1978	30-35	Hardfill, general refuse, septic tank sludges, oil/water separator sludges	100-150	Trench method - 4-6' trench depths with 3' cover daily and only 2 acres in water table.	Landfill inactive - 4-5' final cover not reseeded	Sandy Soil	Spill creek drainage ditch	• Highly permeable soils • No visual evidence of contamination
D4	Disposal Pit Near Skeet Range/Postl Lake	EJ 549450 3370800	1970's	15'w,20'l,8'd	Solvents, drums, excess insecticides, miscellaneous refuse	<1	Pit - no daily cover.	Disposal pit uncovered	Sandy Soil	To Choctawhatchee Bay	• Highly permeable soils • Potential groundwater contamination • Visual evidence of rusty drums, hardfill
D5	A-19 Drum Disposal Site	EJ 547510 3373430	1960's-'70's	2	Hardfill, empty fuel oil drums, solvent containing drums	Unknown	Dumps over ravine - cover with local soil	Inactive - covered with local soil - deciduous tree underbrush growth, a few empty drums visually evident.	Sandy Soil	Surface drainage to swampy area over ravine	• Highly permeable soils • Rusty empty drums evident at low side of fill
D6	End of Runway 01 Hardfill	EJ 546950 3374290	1970's	<2	Hardfill construction rubble, cars, asphalt	<20	Fill over end of runway along slope-12'-16' fill	Inactive, covered with local soil, underbrush growth	Sandy Soil along slope	Run off drainage to swampy area below runway	• None evident
D7	Receiver Area Disposal Site	EJ 547320 3373830	1970's	10	Hardfill, (tires, wire, spools, mattresses, concrete), asbestos insulation, PCB capacitors, PCB transformers, electrical components, paint shop wastes, AFFF, Waste fuel oils, solvents, septic tank pumpings, Federal Prison garbage, waste pesticides and containers	80	Trench method, 3-15' depth, ravine fill method	Inactive 85% covered with 2' soil, embankments uncovered	Sandy Soil drainage to swampy area	Surface drainage to swampy area	• Rusty drums observed along embankment and in beaver pond along edge of fill • Highly permeable soil
S1	Old [illegible] Storage Yard	EJ 545270 3377000	1950-1981		Waste fuel drum storage, kerosene, gasoline, PD 680	Unknown	Storage facility	Active	Sandy soil, scattered underbrush and [illegible] trees	Level land	• Several rusty drums, kerosene stored in open • Soil stains from drum storage in past in 10 X 20' area.

TABLE 4.8 (Continued)
INACTIVE EGLIN AFB SOLID WASTE STORAGE AND DISPOSAL SITES

Site	Site Name	UTM Coordinate Location	Period of Operation	Area Size (Acres)	Suspected Types of Wastes	Estimated Quantity of Waste (Acre-Ft)	Method of Operation	Closure Status	Geological Setting	Surface Drainage	Evident and Potential Problems
EGLIN RESERVATION											
D8	CB Lab Landfill	EJ 563870 3376640	1964-1971	<1	Biological petri dishes, autoclaved materials, plastic, wood, ce simulants, alcohol solvent	<5	Ravine Fill and cover	Landfill inactive - local sandy soil cover material in place-scattered debris	Very sandy soils	N.A.	• Highly permeable soils • No visual evidence of contamination
D9	Mullet Creek Disposal Site	EJ 565050 3376510	Late 1960's-Early 1970's	<1	Hardfill (plastics, concrete debris, rubber), garbage, herbicide drums, other empty drums	<5	Open dump - No cover	Inactive unclosed site	Sandy/clayey soil along embankment above headwaters of Mullet Creek	To Mullet Creek	• Many rusty drums evident at site along with hardfill materials • Leachate seepage to Mullet Creek
D10	C-52 Drum Disposal Area	EJ 562790 3379070	1973	<1	Known decontaminated crushed herbicide drums	<1	Buried	Closed with local cover material. No surficial evidence of disposal	Clayey/Sandy soil	N.A.	Known wastes disposed at this site do not present a potential for contamination
D12	C-80C Hardfill	EJ 561825 3389625	Unknown	<1	Celotex bundles, lumber, metal, aluminum, copper, hardfill	<5	Borrow pit fill and cover	Not closed	Clayey soil pit site	N.A.	Suspected wastes disposed at this site are not considered a problem
D13	Old Field No. 1 Landfill	EJ 561200 3393440	1940's-'50's	1-3	Hardfill from runway debris, garbage from base operation	<5	Ravine fill	Inactive site - closed with local cover materials	Clayey/sandy soil	N.A.	Suspected wastes disposed at this site are not considered a problem
D14	Isotope Burial Area	EJ 564055 3395020	1972	Small 8' depth hole	Zinc 65 Isotope	100 rounds	Rounds shot into deflector and down into	Inactive closed and covered site	N.A.	N.A.	• Half life was 115 days • No potential contamination problems exist
D15	Field No. 2 North Sanitary Landfill/Hardfill	EJ 553330 3383640	1960's-73	3-4	Runway debris, scrap metal, building demolition debris, refuse, trash, vehicle maintenance solvents, herbicide drums found in pond in past	30-50	Trench excava-and area fill (15-18' depth) around Beaver Pond on North and South sides	Inactive, partially covered site	Sandy/clayey soils	To Beaver Pond	• Two reddish orange leachate streams from fill area seep into south side of the Beaver Pond • Other herbicide drums probably were disposed in pond
D16	Field No. 2 East	EJ 554310 3383650	Early 1970's-'81	3-4	Refuse, garbage from Bold Eagle Operations, construction debris, scrap materials. No hazardous wastes suspected present	15-20	Trench method 4'-6' depth, daily 2 1/2' cover, a 2 1/2 final cover.	Inactive except during Bold Eagle Exercise	Very sandy soils	N.A.	No potential contamination problems exist due to the nature and locale of wastes deposited.

*N.A. - Not Applicable

Source: Personnel Interviews

TABLE 4.8 (Continued)
INACTIVE EGLIN AFB SOLID WASTE STORAGE AND DISPOSAL SITES

Site	Site Name	UTM Coordinate Location	Period of Operation	Area Size (Acres)	Suspected Types of Wastes	Estimated Quantity of Waste (Acre-Ft)	Method of Operation	Closure Status	Geological Setting	Surface Drainage	Evident and Potential Problems
D17	Field No. 2 Drum Disposal Site	EJ 553350 3381670	Unknown	1-2	Empty diesel fuel drums, solvent drums (empty and partially full) herbicide drum removed from the area in the past.	NA	Dump	Inactive unclosed	Sand soils Near Beaver Pond area	To Beaver Pond	Drums scattered throughout Beaver Pond - some submerged, others half submerged - quantity unknown, probably less than 20 or so
D21	Old Field No. 5 Sanitary Landfill	Exact Loc. Unknown Approx. Loc. EJ 535530 3383000	Unknown	Unknown	Hardfill, refuse	Unknown	Trench Method	Inactive completed closed and reforested. No evidence remaining of site	Sandy soils	NA	No potential contamination problems exist due to locale and nature of wastes deposited
D22	Field No. 6 Sanitary Landfill	EJ 525620 3390730	1940's-'70's	2	Refuse, empty drums, landfill	10-15	Trench Method with 4'-8' trench depths with 1-2' daily cover	Inactive closed site. Closed with local clayey/ sandy soil	Clayey sand soils	Creek on south side of fill	• No evidence of contamination • No problems anticipated at this site due to locale and nature of the waste
D23	Wolf Creek Drum Disposal Area	EJ 519650 3384350	1972-1973	NA	In past 6 herbicide white and herbicide orange partially full and empty drums removed from creek	NA	NA	NA	Stream Bed	Wolf Creek	Drums removed from site - No evidence of existing disposal.
D24	Old Field No. 7 Landfill	EJ 517900 3377600	1940's-1977	3-4	Hardfill, refuse	30-40	Trench method to 10-12' depths with daily cover	Closed site with local 2-3' cover. Some scattered debris still evident.	Clayey sandy soil not in water table	NA	No potential problems due to nature of the wastes deposited.
D38	Field No. 4 Landfill	EK 540150 3375150	Unknown	<2	Hardfill/Sanitary wastes	Unknown	Trench method 4-6' depth	Inactive - closed with local soil cover	Sandy soil	NA	No potential problems due to wastes disposed and locale
D39	A-15 Disposal Site	EJ 527480 3362300	Unknown	50'X100'	Hardfill materials concrete, metal, wood, wire	1-2	Area fill	Inactive - closed with local soil cover	Very sandy	Choctawhat-chee Bay	No potential problems due to nature of wastes disposed
D40	A-11 Disposal Site	EJ 527480E 3362300	1960's-1970's	0.5	Hardfill, metal spools, drums of waste oil, solvent drums with solvent	6-7	Area fill	Inactive - closed with local sandy soil	Very sandy	Choctawhat-chee Bay	• Highly permeable soils • Close proximity to Bay
DUKE FIELD											
D19	Duke Field Sanitary	EJ 565360 3391320	1940's-1976	4-5	Garbage, hardfill, empty drums, plastics, wood, wire, trash	50-60	Trench operation 10-12' trench depths	Closed with 3-4' local soil	Sandy soil	NA	No potential problem due to nature of wastes disposed and locale.
D20	Duke Field Hardfill	EJ 564780 3390800	1940's-1978	1	Equipment parts, wood, other hardfill	5-10	Area fill	Inactive - closed with local sandy soils	Sandy soil	NA	No potential problems due to nature of wastes disposed

N.A.: Not Applicable
Source: Personnel Interviews at Eglin AFB

TABLE 4.8 (Continued)
INACTIVE EGLIN AFB SOLID WASTE STORAGE AND DISPOSAL SITES

Site	Site Name	UTM Coordinate Location	Period of Operation	Area Size (Acres)	Suspected Types of Wastes	Estimated Quantity of Waste (Acre-Ft)	Method of Operation	Closure Status	Geological Setting	Surface Drainage	Evident and Potential Problems
HURLBURT FIELD											
D26	Sanitary Landfill	EJ 525600 3365700	1972-1979	5	Rubbish, trash, tires, boards, old building materials, concrete, asphalt, empty drums, waste treatment plant sludge, solvent degreasers, waste oils, pesticide containers, PCB Capacitors	25-30	Trench method of operation - 4-5' depth	Inactive - closed with 2' local cover soil, reseeded with grass	Sandy silty soil	To East Bay Swamp and Turtle Creek	• Highly permeable soil • High groundwater table • Proximity to wetlands • Visual evidence of sufficient leachate contamination
D27	Hardfill (Ammo Area)	EJ 527200 3365600	1960's	0.5	Hardfill, concrete, asphalt, trees, no raw garbage or drums	2-4	Area fill	Inactive - closed site.	Sandy soil area near small pond which drains to a ditch off into East Bay Swamp	East Bay Swamp	No potential contamination due to nature of wastes disposed at site.
D28	Hardfill	EJ 527800 3365650	1970's	1	Hardfill, metal, concrete, asphalt, wood						
D29	Sanitary Landfill	EJ 528400 3365800	1966-1968	3-4	Putrescible garbage, waste treatment sludges and liquids, empty and partially full drums of unknown materials	4-5	Fill old borrow pit	Inactive - closed site.	Clayey sand soil borrow pit - water table at 4'-5' depth	East Bay Swamp	
D30	Sanitary Landfill	EJ 528040 3365730	1964-1966	1	Putrescible garbage, waste treatment sludges and liquids in a pit - empty and partially full drums of unknown materials	15-20	Trench method 4'-5' depth with daily cover of 8-10"	Inactive - closed with local cover Obstacle course over fill area	Sandy area with water table at 4'-5'	East Bay Swamp	• Highly permeable soils • Close proximity to water table
D31	Landfill	EJ 528180 3365600	1962-1964	1	Raw garbage, sludges hardfill material, empty drums of unknown material	4	Trench method in old borrow pit - daily cover	Inactive - closed with with local cover and seeded	Clayey, sandy soils in old borrow pit - water level at 4' depth	East Bay Swamp	• Highly permeable soils • Fill to water table depth
D32	Dry Landfill	EJ 528800 3365700	1956-1958	0.5	Raw garbage, empty drums, hardfill	4-5	Trench method at 4'-5' deep in old borrow pit daily cover	Inactive - closed with local cover and seeded	Clayey, sandy soils in old borrow pit - water level at 4'-5' depth	East Bay Swamp	• Highly permeable soil • Fill to water table depth
D33	Sanitary Landfill	EJ 529000 3366380	1958-1960	2-3	Lumber, trees concrete rubble	2-3	Trench method with 4'-5' depth daily cover	Closed with local soil cover	Sandy soil and hardpan	East Bay Swamp	• Highly permeable soil • Fill to water table
D34	Sanitary Landfill	EJ 529100 3366200	1960-1962	5	Garbage, refuse, empty drums	8-15	Trench method to 4'-5' depth to water table	Closed with several feet local cover	Sandy soil adjoins river swamp	East Bay Swamp	
			1960-1962		Garbage, empty drums	20-25	Trench method with 4'-5' depth daily cover	Closed with local permeable soils reseeded with grass and pines	Sandy soil area	East Bay Swamp	Highly permeable soil
D35	Sanitary Landfill	EJ 529480 3364585	1968-1972	2-3	Garbage, refuse, no hardfill, drummed materials unknown	12-18	Trench method to 6'depth	Closed with local cover	Clayey, sandy soil in old borrow pit on ridge not to water table	Santa Rosa Sound	• Highly permeable soils
D36	Dry Landfill	EJ 530325 3364760	1970-1972	1	Hardfill, concrete, underbrush, asphalt	8	Area fill of borrow pit 8' depth	Inactive - closed with local cover 2-3'	Clayey, sandy soil in old borrow pit	N.A.	No potential site problems due to nature of the wastes deposited

contained on bullets fired at a metal deflector into a dry trench 8 feet deep and 30 feet long. The trench was refilled with local material. Since the half-life of zinc-65 is only 115 days, no potential for migration exists. At the Wolf Creek Drum Disposal Site (Site D23) several 55-gallon drums were found in the stream head waters during the early 1970's. These drums were cleaned, crushed and sent to the C-52 drum disposal site. No additional drums are known to exist at this site so a contamination problem does not exist. At the old CE Equipment Storage Yard (Site S1) a few drums of kerosene or PD-680 were stored in the recent past. Based on the site visit, some evidence of drum leakage is visually evident over a 10 foot x 20 foot area. The surficial soils are clayey-sandy at the site with the ground-water table at 5 to 10 feet. Due to the site proximity to surface and ground waters and minimal amount of leakage observed, no potential for off-site migration is anticipated. Finally, the Empty Drum Storage Area (Site S7) is a fenced site for storage of empty drums used on the range areas. These drums are empty, stored at a remote site, and based on a site visit, present no potential for migration of contamination off the base.

Inactive storage and disposal sites at Eglin which present a potential for migration of contamination due to the nature of the wastes deposited and proximity to ground water and surface waters include the following:

- Site D1 - Eglin Main Base Landfill (1940's-1960's)
- Site D2 - Eglin Main Base Landfill (1960's-1973)
- Site D3 - Eglin Main Base Landfill (1973-1978)
- Site D4 - Disposal Pit near Skeet Range
- Site D5 - A-19 Drum Disposal Site
- Site D7 - Receiver Area Disposal Site
- Site D9 - Mullet Creek Disposal Site
- Site D15 - Field No. 2 North Sanitary Landfill/Hardfill
- Site D17 - Field No. 2 Drum Disposal Site
- Site D40 - A-11A Disposal Site

A profile of each site is presented in Table 4.8. Supplemental additional information for selected sites is presented below.

Eglin Main Base Landfill (Site D1). This site, encompassing roughly 100 acres, served as the main landfill from the early 1940's to early 1960's. Based on personnel interviews, the site extends from the

DPDO Drum Storage Yard (Site S2) southeastward under the CE Asphalt Plant then parallel to Range Road on the north side to the Skeet Range area near Postil Lake with the exact boundaries undefined. The site was operated according to the trench method with 10 to 12 foot trench depths into the ground-water table. As noted in Table 4.8, a wide variety of wastes were landfilled at this site. Since less recycle and recovery through DPDO occurred during this period at Eglin many waste solvents and other liquid materials, including waste from industrial shops, were landfilled at this site.

This site is located in a very sandy area with no clay. No liner or leachate collection system exists. The site is closed with several feet of local soils. Although no visual evidence of contamination or migration of contamination exists, the likelihood for migration of contamination is high due to the location of filled materials in the water table and the site's close proximity to Choctawhatchee Bay. The leached materials, including solvents, PCB's, etc., which are located within this landfill, are persistent enough to remain in a soil or aquatic environment as toxic materials.

Eglin Main Base Landfill (Site D2). This site served as the main landfill from the early 1960's to about 1973. Since the site was the main landfill for Eglin Main during this period, a variety of liquid wastes, along with refuse, were disposed here as illustrated in Table 4.8. Although no visual evidence of contamination exists, since the site is covered with several feet of local permeable soil, the potential for migration and persistence of contaminants into ground water and, eventually off site, exists.

Disposal Pit Near Skeet Range (Site D4). This 8 foot deep open pit served as an unauthorized open dump for some insecticides, waste solvents, and a few empty drums during the 1970's. The site is currently not covered and located in sandy soils within a forested area. Although no water quality evidence exists to document contamination, rapid infiltration from rainfall at the site provides a pathway into the ground water and ultimately, into nearby Choctawhatchee Bay. The pit is located within three hundred feet of Postal Lake.

Receiver Area Disposal Site (Site D7). This 10-acre site is located adjacent to Tom's Pond in a sandy soil area. The main part of the fill has been closed with several feet of local cover. However, the edges of the fill next to Tom's Pond are open. Empty drums and hardfill materials are obvious along the edge of the fill and in the water at the base of the fill.

This site was used to dispose of 10 to 12 dump truck (about 6 cu yd each) loads of transformers, capacitors and electrical components from the salvage yard in 1977. In additon to the other items listed in Table 4.8, about 30 drums of fire fighting foam, AFFF with a COD of 400,000 mg/l, were disposed at this site.

No visual evidence of leachate generation was obvious during the site visit. However, considering the persistence and nature of the wastes deposited, cover materials and proximity to surface waters, the potential for migration of contamination exists.

Field No. 2 North Sanitary Landfill/Hardfill (Site D15). Details concerning this site are illustrated in Table 4.8. It should be emphasized that two leachate streams were observed emanating from the base of this fill into the southeast corner of the beaver pond which borders the site. The site contains primarily hardfill, garbage and refuse which was visually evident during the site visit. The landfill is not totally covered with local soil materials.

A-11A Disposal Site (Site D40). This site is located within 15 feet or so of Santa Rosa Sound. Details of the site are illustrated in Table 4.8. During the site visit, empty rusty drums were observed along the edge of the fill area. (See Appendix F photo). The fill was closed with local sand. Due to the nature of wastes disposed at the site and its proximity to Santa Rosa Sound, a potential for contamination migration exists.

Hurlburt Field

Several inactive disposal sites at Hurlburt Field are not considered a potential for contamination or migration of contamination due to the nature of the wastes deposited and distance from ground water and surface waters. Those sites which contain primarily hardfill without any other known hazardous wastes are not considered a problem. These sites include the following:

- Site D27 - Hardfill
- Site D28 - Hardfill
- Site D36 - Dry Landfill

A summary of site locations (UTM coordinates) and site characteristics is presented in Table 4.8. The sites are illustrated on the location maps in Appendix E.

The following inactive disposal sites at Hurlburt present a potential for migration of contamination due to the nature of the wastes deposited and their proximity to ground water and surface waters:

- Site D26 - Sanitary Landfill
- Site D29 - Sanitary Landfill
- Site D30 - Sanitary Landfill
- Site D31 - Landfill
- Site D33 - Sanitary Landfill
- Site D34 - Sanitary Landfill
- Site D35 - Landfill

These sites are all described with respect to location and site characteristics in Table 4.8. Supplemental additional information concerning the major Hurlburt sanitary landfill (Site D26) is included below.

Hurlburt Sanitary Landfill (Site D26). This approximately 5-acre landfill, located west of the E.O.D. Disposal Site adjacent to East Bay Swamp, was operated from 1972 to 1979. The site was closed in 1979 with about 2 feet of local sandy soils and reseeded with grass. The fill was operated in and around an old borrow pit area. The trench method of operaton was utilized to about 4 to 5 feet, about 1 foot into the water table at this location. As illustrated in Table 4.8, this site contains a variety of wastes of non-hazardous and hazardous nature which will persist in the soil and aquatic environment for long periods of time. The East Bay Swamp borders this landfill. Due to site soil conditions and water table levels, migration of contamination to the East Bay Swamp is likely. During the site visit, ponded water was noted.

Waste Treatment Operations

An overview of historical waste treatment plant (WTP) operations for Eglin AFB is presented in the following sections. Key topics

pertinent to the evaluation of contamination potential related to Eglin and Hurlburt waste treatment operations include the following:

- Waste Sources
- Waste Characteristics
- Waste Treatment Facility Descriptions
- Effluent Discharge
- WTP Sludge Disposal

Sewage Waste Sources and Characterization

The major sewage waste sources for Eglin Main, Hurlburt and outlying areas are illustrated in Table 4.9. These sources include an annual average of about 2.5 MGD of domestic (sanitary) sewage and 0.20 MGD of industrial sewage (TAB A-1). The industrial sewage contains minor amounts of lab and shop liquid wastes used for rinsing.

Waste Treatment Facility Descriptions. Active waste treatment plants at Eglin are summarized in Table 4.10 in terms of WTP location, type of facility, design flow, and effluent discharge area. Outlying areas are generally provided sewage treatment with septic tanks and drain fields which were designed to treat domestic sewage. Approximately 120 septic tank areas and seepage fields exist at various locations on Eglin, Hurlburt and Santa Rosa Island. All of these septic tank areas are domestic in nature.

Effluent Discharge. Effluent spray irrigation systems were implemented at Eglin in 1974. Since that time, point source effluent discharge has been practically nil. Eglin has no point sources of discharge from the base. Hurlburt Field (formerly Eglin Auxiliary Field No. 9) WTP was connected to the Mary Esther effluent spray irrigation field in late 1979. Prior to that time, effluent from Hurlburt Field was discharged to Santa Rosa sound under NPDES Permit No. FL 0003174. Prior to 1976 the Main Base waste treatment plant and Plew waste treatment plants discharged to Choctawhatchee Bay. In 1976 the Main Base Plant initiated use of a 30-acre effluent spray irrigation site in the Cobbs Overrun Area and the Plew treatment plant initiated use of a 60-acre site in the runway 12 approach area. In 1980 the Cobbs Overrun spray field was abandoned and all effluent discharged in an expanded 180-acre spray field in the runway 12 approach area.

TABLE 4.9

MAJOR SEWAGE WASTE SOURCES

Major Sources of Waste	Percent Composition	Specific Waste Sources
Eglin Military Housing Area	50%	Domestic sanitary sewage
Eglin Main Base Area	25%	Domestic sanitary sewage which includes minor amounts of: • Photo lab wastes • Welding and Plating operation wastes • Oil water separator waste fuels • Painting, corrosion control, & aircraft washing wastes
Hurlburt Fields	20%	Domestic sanitary sewage which includes minor contributions of Hurlburt industrial operations wastes
Outlying Areas	5%	Domestic sanitary sewage

Reference: TAB A-1, Eglin AFB Civil Engineering Master Plan, Oct. 1979.

TABLE 4.10

MAJOR EGLIN AFB WASTEWATER TREATMENT SYSTEMS

Plant Location	Type of WTP	Design Capacity	Flow MGD	Recent Effluent Discharge		Historical Effluent Discharge		Sludge Disposal
				Size-Location	Period of Operation	Size-Location	Period of Operation	
Main Base	Grit chamber, trickling filter, final clarifiers, chlorination, aerobic sludge digestion	0.8-1.0	0.60-0.80	180 acres- Runway 12 Approach effluent disposal area	1980-81	1. Direct Discharge Choctawhatchee Bay 2. 30 acre- Cobb Overrun Effluent Disposal Area	- 1976 1976-80	Landspreading various locations (See Fig. 4.4)
Plew	Grit chamber, activated sludge, final clarifiers, chlorination, aerobic sludge digestion	1.5	1.3	180 acres- Runway 12 Approach effluent disposal area	1980-81	1. Direct Discharge Choctawhatchee Bay 2. 60 acre- Runway 12 Approach Area	- 1976 1976-80	Landspreading various locations (See Fig. 4.4)
Field No. 3	Grit chamber, activated sludge, final clarifiers, chlorination, aerobic sludge digestion	0.125	0.056	20 acres- Field No. 3 spray area	1974-81	-	-	Landspreading Field No. 3 (See Fig. 4.4)
Site C-6	Extended aeration, chlorination	0.02	0.010	3.0 acres- Site C-6 spray area	1974-81	-	-	Landspreading Site C-6 (See Fig. 4.4)
Field No. 6	Extended aeration, chlorination	0.072	0.030	9.3 acres- Field No. 6 spray area	1974-81	-	-	Landspreading Field No. 6 road shoulders.
Hurlburt Field	Trickling filter	0.726	0.525	69 acres- Mary Esther spray area	1979-81	Direct Discharge Santa Rosa Sound	1979	Landspreading at various locations along runways at Hurlburt Field (See Fig. 4.4)

The Hurlburt Field WTP effluent discharges to 69 acres at the Mary Esther spray area. Effluent discharge for the WTP at Field No. 3, Site C-6 and Field No. 6 are currently discharged to the areas noted in Table 4.10 and illustrated in the maps in Appendix E.

Sludge Disposal. Waste treatment plant sludges from the various WTP locations are landspread at locations illustrated in Figure 4.4 and noted in Table 4.10. The overrun areas were used from 1962 - 1972. All other areas have been used since 1972.

Evaluation of Effluent Discharge and Sludge Disposal Site Potential Contamination

Based on a review of existing waste treatment plant sources, water quality data and field inspections of the Mary Esther spray area, Main Base WTP and Plew WTP, the following general observations are pertinent to an assessment of potential contamination:

1) The Main Base, Plew and Hurlburt waste treatment plants receive a variety of installation operation wastes which contain minor industrial contributions from the corrosion control labs, photo lab and metal plating operations. Many of these wastes are biodegradable and will be significantly removed through the waste treatment plant. However, sufficient sludge metals analyses are not available to establish the hazardous or non-hazardous nature of these sludges.
2) Crops have not been grown on any sludge disposal areas or effluent spray areas at Eglin and Hurlburt Field other than hay used for seeding mulch. Hence, the primary anticipated pathways for potential contamination would be by subsurface infiltration to ground water.
3) Waste treatment plants at base locations other than Main Base, Plew and Hurlburt treat essentially sanitary waste and have not presented a contamination problem due to their geologic setting and nature of the waste.

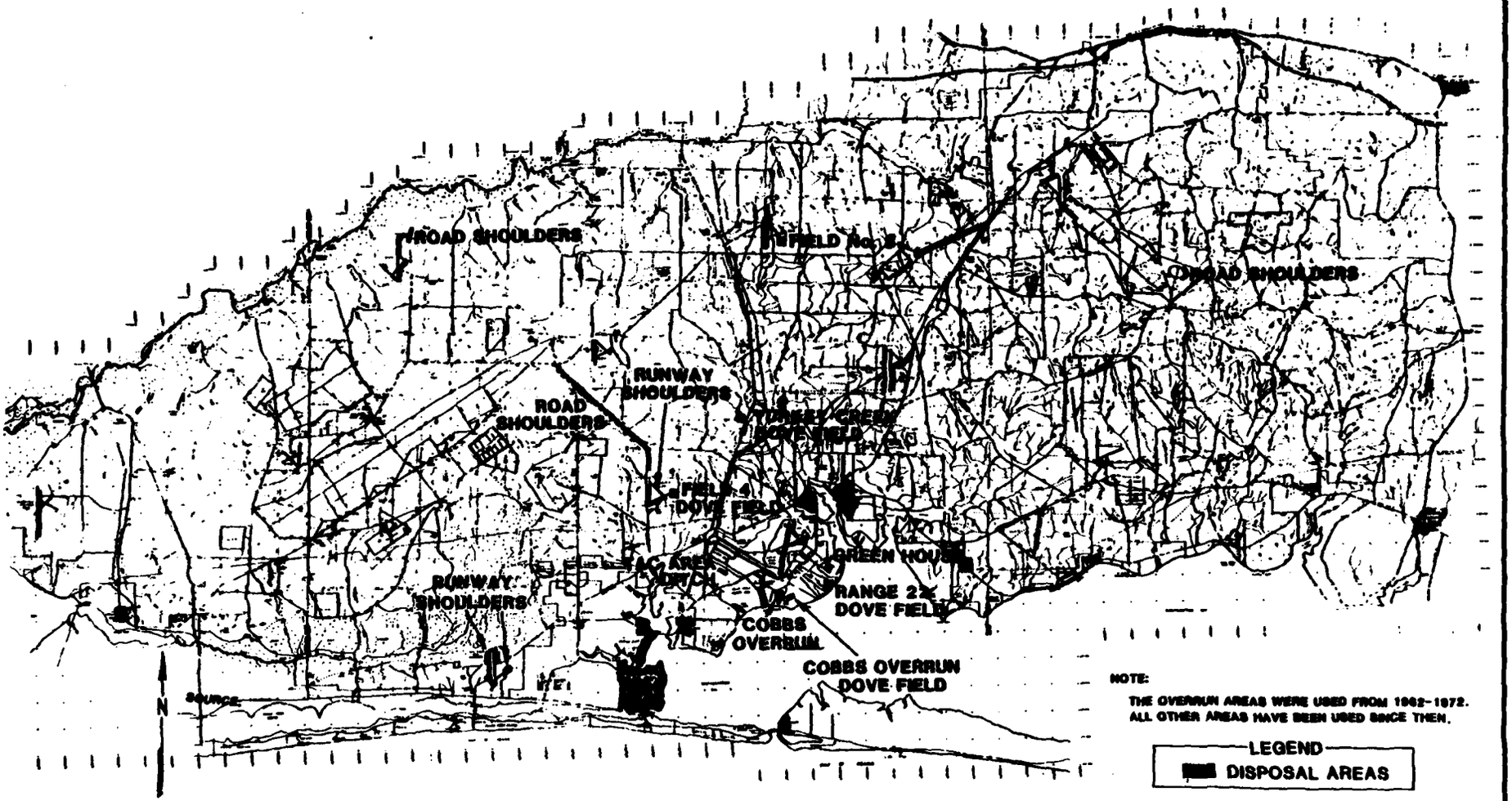
EVALUATION OF PAST WASTE DISPOSAL ACTIVITIES

Thirty sites associated with Eglin AFB were identified as containing hazardous material resulting from past waste disposal activities and having the potential for migration of contamination off base

FIGURE 4.4

EGLIN AFB

WASTE TREATMENT PLANT SLUDGE DISPOSAL AREAS



PERSONNEL INTERVIEWS AT EGLIN AFB

boundaries. These sites have been assessed using a rating system which takes into account factors such as site characteristics, waste characteristics, potential for contamination and waste management practices. The details of the rating procedure are presented in Appendix G and the results of the assessment are summarized in Tables 4.11 and 4.12. The sites are listed in order of ranking, based on the rating scores developed for the individual site. The rating system is designed to indicate the relative need for more detailed site assessment and/or remedial action. The information presented in Table 4.11 would be used as a guide for assigning priorities for dealing with the Eglin AFB disposal sites. The rating forms for the individual waste disposal sites are presented in Appendix H for review.

It should be pointed out that the rating system does not take into consideration a "time factor" which is especially pertinent when considering spills and fire training areas. If a "time factor" were considered the site rating would lower with time.

Those sites with overall scores greater than 64 are in the First Priority category and are sites of primary concern based on their potential for waste migration off-site. These sites require further investigation in Phase II. Sites of secondary concern fall into the Second Priority with scores from 60-64. Further investigation for these sites will be recommended. Third Priority sites (scores from 0 to 59) are other sites with the potential for contamination, but with a low probability for migration off-site.

The Eglin Main Landfill (Site D1), used during the 1940's to early 1960's, received the highest ranking based on an overall score of 79.

TABLE 4.11

PRIORITY RANKING OF POTENTIAL CONTAMINATION SOURCES

EGLIN AFB

Rank	Site Number	Site Name	UTM Coordinates	Overall % Assumed	Overall Score
1	S1	Eglin Main Landfill (1940's - 1960's)	EJ 549350 3370600	16	79
2	S2	Eglin Main Landfill (1960's - 1973)	EJ 545400 336900	10	76
3	S26	Hurlburt Field Sanitary Landfill (closed 1979)	EJ 526600 3365700	0	65
4	S3	Eglin Main Landfill (1973 - 1978)	EJ 548000 3370700	12	65
5	S41	Hurlburt Field E.O.D. Disposal Site	EJ 526A00 3365800	4	65
6	S40	A-11A Disposal Site	EJ 527480 3362300	16	64
7	S7	Receiver Area Landfill	EJ 547320 3373830	16	62
8	T3	Hardstand 7	EJ 546180 3372820	0	59
9	T1	Herbicide Test Grid	EJ 566370 3376035	0	59
10	S4	Disposal Pit Near Skeet Range	EJ 549450 3370800	8	59
11	S18	Valparaiso/Niceville Landfill	EJ 547260 3379450	4	58
12	S9	Mullet Creek Disposal Site	EJ 565050 3376510	16	57
13	S2	DPDO Storage Yard	EJ 548080 3371500	4	57
14	S15	Field No. 2 North Landfill	EJ 553330 3383640	16	57
15	S5	A-19 Drum Disposal Site	EJ 547510 3373430	16	57
16	S17	Field No. 2 Drum Disposal Site	EJ 553350 3381670	8	54
17	S3	CE Storage Yard	EJ 548700 3371430	8	54
18	I34	Welding/Electroplating Shop	EJ 546700 3371200	8	54
19	I33	Paint Shop	EJ 546700 3371200	8	54
20	S30	Hurlburt Field Sanitary Landfill	EJ 528040 3365730	8	53
21	S29	Hurlburt Field Sanitary Landfill	EJ 528400 3365800	8	53
22	S37	Wright Landfill	EJ 535940 3370730	4	52
23	I31	Missile Maintenance	EJ 544875 3373500	8	52
24	S31	Hurlburt Field Landfill	EJ 528180 3365600	8	51
25	S32	Hurlburt Field Dry Landfill	EJ 528800 3365700	8	51
26	I36	Hurlburt Field Allied Trades Paint Booth	EJ 529140 3364800	8	50
27	I32	Electric Shop	EJ 546950 3371500	0	49
28	S34	Hurlburt Field Sanitary Landfill	EJ 529100 3366200	12	44
29	S35	Hurlburt Field Sanitary Landfill	EJ 529480 3364585	8	44
30	S33	Hurlburt Field Sanitary Landfill	EJ 529000 3366380	12	44

NOTE: This Priority Ranking was performed according to the Hazard Evaluation Methodology described in Appendix G. Site Waste Rating Forms - in order of ranking - are presented in Appendix E.

TABLE 4.12

SITE RATING SUBSCORES

EGLIN AFB

Rank	Site Number	Receptor		Pathways		Waste Characteristics	Waste Management		
		% Assumed	Subscore	% Assumed	Subscore	Subscore	% Assumed	% NA or Missing	Subscore
1	D1	0	72	20	65	90	22	0	91
2	D2	0	67	20	63	70	22	0	86
3	D26	0	37	0	68	70	0	0	81
4	D3	0	50	20	60	70	11	0	79
5	D41	0	26	0	68	80	11	0	71
6	D40	0	72	20	70	50	22	0	64
7	D7	0	57	22	67	60	22	0	53
8	T3	0	50	20	61	50	0	0	67
9	T1	0	44	0	86	60	0	22	36
10	D4	0	35	0	69	80	0	11	47
11	D18	0	48	0	57	60	0	0	72
12	D9	0	41	0	85	50	11	0	49
13	S2	0	54	10	57	50	0	22	65
14	D15	0	39	20	71	50	22	0	61
15	D5	0	63	20	57	50	22	11	51
16	D17	0	43	20	55	50	0	0	65
17	S3	0	35	20	69	50	0	22	59
18	IS4	0	46	20	53	50	0	22	67
19	IS3	0	46	20	53	50	0	22	67
20	D30	0	50	20	50	50	0	0	62
21	D29	0	50	20	50	50	0	0	62
22	D37	0	29	0	81	40	11	0	49
23	IS1	0	50	20	57	50	0	0	50
24	IS6	0	28	20	53	50	0	0	67
25	D31	0	50	20	50	40	0	0	62
26	D32	0	50	20	50	40	0	22	58
27	IS2	0	35	20	49	50	0	22	61
28	D34	0	24	20	53	40	11	0	57
29	D35	0	33	20	46	40	0	0	56
30	D33	0	24	20	53	40	11	0	57

SECTION 5

CONCLUSIONS

SECTION 5
CONCLUSIONS

The goal of Phase I of the IRP was to identify the potential for environmental contamination from past waste disposal practices at Eglin AFB and to assess the probability of contaminant migration beyond the installation boundaries. Based on the results of the project team's two one-week field inspections, review of office files and records, and interviews with base personnel, past employees and state and local government employees, the following conclusions have been developed. Table 5.1 contains the priority ranking of sites at Eglin AFB with potential for off-base contamination migration. All other sites assessed in this study have no potential of contaminant migration.

LANDFILLS

1. Eglin Main Base Landfill (Site D1), operated during the 1940's-1960's, presents the greatest potential for off-site migration of contaminants due to the following:
   a. Size: about 100 acres
   b. Nature of wastes disposed: waste oils, waste solvents, waste treatment sludges, PCB capacitors, partially empty pesticide containers, general refuse, hardfill
   c. Location: located in sandy soils of the upper sand and gravel aquifer with a high water table, and in close proximity to the installation boundary and drinking water wells which tap the Floridan Aquifer.
2. Eglin Main Base Landfill (Site D2), operated during the early 1960's to 1973, also presents a high potential for off-site migration of contaminants.
3. Hurlburt Field Sanitary Landfill (Site D26), Eglin Main Landfill (19'3-1978) (Site D3), Eglin Receiver Area Landfill (Site D7), rlburt Field E.O.D. Disposal Site (Site D41) and the A-11A Disposal Site (Site D40) are the next key disposal areas with

TABLE 5.1

PRIORITY RANKING OF POTENTIAL CONTAMINATION SOURCES

EGLIN AFB

Rank	Site Number	Site Name	UTM Coordinates	Overall % Assessed	Overall Score
1	D1	Eglin Main Landfill (1940's - 1960's)	EJ 549350 3370600	16	79
2	D2	Eglin Main Landfill (1960's - 1973)	EJ 545400 336900	10	76
3	D26	Hurlburt Field Sanitary Landfill (closed 1979)	EJ 526600 3365700	0	65
4	D3	Eglin Main Landfill (1973 - 1978)	EJ 548000 3370700	12	65
5	D41	Hurlburt Field S.O.D. Disposal Site	EJ 526A00 3365800	4	65
6	D40	A-11A Disposal Site	EJ 527400 3362300	16	64
7	D7	Receiver Area Landfill	EJ 547320 3373830	16	62
8	T3	Hardstand 7	EJ 546180 3372820	0	59
9	T1	Herbicide Test Grid	EJ 566370 3376035	0	59
10	D4	Disposal Pit Near Skeet Range	EJ 549450 3370800	8	59
11	D18	Valparaiso/Niceville Landfill	EJ 547260 3379450	4	58
12	D9	Mullet Creek Disposal Site	EJ 563050 3376510	16	57
13	S2	DPDO Storage Yard	EJ 548000 3371500	4	57
14	D15	Field No. 2 North Landfill	EJ 553330 3383640	16	57
15	D5	A-19 Drum Disposal Site	EJ 547510 3373430	16	57
16	D17	Field No. 2 Drum Disposal Site	EJ 553350 3381670	8	54
17	S3	CE Storage Yard	EJ 548700 3371430	8	54
18	IS4	Welding/Electroplating Shop	EJ 546700 3371200	8	54
19	IS3	Paint Shop	EJ 546700 3371200	8	54
20	D30	Hurlburt Field Sanitary Landfill	EJ 528040 3365730	8	53
21	D29	Hurlburt Field Sanitary Landfill	EJ 528400 3365800	8	53
22	D37	Wright Landfill	EJ 535940 3370730	4	52
23	IS1	Missile Maintenance	EJ 544875 3373500	8	52
24	D31	Hurlburt Field Landfill	EJ 528180 3365600	8	51
25	D32	Hurlburt Field Dry Landfill	EJ 528800 3365700	8	51
26	IS6	Hurlburt Field Allied Trades Paint Booth	EJ 529140 3364800	8	50
27	IS2	Electric Shop	EJ 546950 3371500	0	49
28	D34	Hurlburt Field Sanitary Landfill	EJ 529100 3366200	12	44
29	D35	Hurlburt Field Sanitary Landfill	EJ 529480 3364585	8	44
30	D33	Hurlburt Field Sanitary Landfill	EJ 529000 3366380	12	44

NOTE: This Priority Ranking was performed according to the Hazard Evaluation Methodology described in Appendix C. Site Waste Rating Forms - in order of ranking - are presented in Appendix E.

potential for off-site migration of contaminants. All of these sites have been closed.

a. Hurlburt Sanitary Landfill (1972-1979)(Site D26) and Eglin Main (Site D3) wastes are similar in nature and both sites are located in sandy soil areas. Visual evidence of leaching exists in areas of the Site D26 landfill. Wastes were filled below the water table level during the site's operation. This site should rank higher priority than Site D3 since wastes from Site D3 were not filled into the water table and no contaminant leaching is visually evident.

b. Hurlburt Field E.O.D. Disposal Site (Site D41) generates seepage which discharges to East Bay Swamp. Unexploded ammunition and non-ignited napalm are the waste sources which present a contaminant potential.

c. A-11A disposal site (Site D40) is located in extremely sandy soil conditions in close proximity to Santa Rosa Sound.

STORAGE AREAS

The DPDO storage yard (Site S2) ranked the highest of the storage areas due to the potential for soil and water contamination resulting from DDT drum leakage, PCB transformer oil leakage, and past spillage of Waste POL.

INDUSTRIAL SHOPS

The highest ranking industrial shops are the Welding and Electroplating shop (Site IS4), the Paint Shop (Site IS3) and the Missile Maintenance area (Site IS1). The hazardous wastes disposed near these shops were relatively small quantities, but are persistent wastes in the local sandy soils.

TEST AREAS

Hardstand 7 (Site T3) and the Herbicide Test Grid (Site T1) were similarly ranked and present a potential for contamination migration of arsenic.

OTHER AREAS

1. The waste treatment plant sludges from Hurlburt Field and Eglin have been landspread at various locations throughout Eglin and Hurlburt. The lack of monitoring information in the landspreading areas prevents identification of past contamination. The nature (hazardous or non-hazardous) of these sludges must be assessed through metals analysis to determine whether these sludges present a potential problem for contamination migration.
2. Hurlburt Field, Plew and Eglin Main Base waste treatment plant effluents have been discharged to spray irrigation areas on the Eglin Reservation. The lack of specific metals and specific organic monitoring information prevents identification of potential for contamination migration.

SECTION 6

RECOMMENDATIONS

SECTION 6

RECOMMENDATIONS

In order to aid in the comparison of Eglin's thirty sites with those sites identified in the IRP at other Air Force Bases, a priority ranking scale has been developed. Those sites with overall scores greater than 64 have been placed, based on their potential for waste migration off-site, in the first priority category and are sites of primary concern. These sites are recommended for investigation in Phase II. Sites with scores from 60 to 64 fall into the second priority category. Investigation of these sites is recommended subsequent to the first priority sites. Third priority sites (scores below 60) are other sites with the potential for contamination, but with a low probability for off-site migration. Using this priority ranking, the following recommendations are made to further assess the potential for contaminant migration from waste disposal areas at Eglin AFB.

RECOMMENDATIONS FOR PHASE II

First Priority

1. It is recommended that a ground-water monitoring program be established at each of the following sites to determine whether there is contamination:

   - Eglin Main Landfill (1940's-1960's) - Site D1
   - Eglin Main Landfill (1960's-1973) - Site D2
   - Hurlburt Field Sanitary Landfill (1972-1979) - Site D26
   - Eglin Main Landfill (1973-1978) - Site D3
   - Hurlburt Field E.O.D. Disposal Site - Site D41.

   Such a monitoring system should consist of at least one monitoring well located hydraulically up-gradient of each site, and three monitoring wells located hydraulically down-gradient of each site. At this time, it is believed that wells comprising such a system will have a total depth on the order of thirty to thirty-five (30-35) feet. The actual design of a ground-water quality monitoring system must be predicated using site-specific hydrogeological data. At a minimum, the following

parameters should be monitored: chloride, iron, manganese, phenol, sodium, sulfate, pH, specific conductance, total organic halogen and total organic carbon.

2. Grab samples of the surface seepage originating at the Hurlburt Field E.O.D. Disposal Site (D41) should be collected to characterize seepage. The leachate on Hurlburt Field sanitary landfill (Site D26) should also be sampled and characterized. At a minimum, these samples should be analyzed for the following parameters: chloride, phenol, iron, manganese, sulfate, pH, specific conductance, total organic halogen and total organic carbon. These samples may be helpful in determining specific analyses required in the well monitoring at these sites.

Second Priority

1. It is recommended that ground water and any surface water leachate sampling be performed at the following sites with similar analyses being carried out as outlined above:
   - A-11A Disposal Site (D40)
   - Eglin Receiver Area Disposal Site (D7)

Low Priority Recommendations

1. Herbicide Application and Unloading Areas:
   a. Collect biological samples near Hardstand 7 (Site T3) and the Herbicide Test Grid (Site T1) and anlayze for total arsenic.
   b. Determine arsenic concentrations and extent of migration of arsenic contamination in the stream and pond sediments downstream from Hardstand 7 (Site T3).
   c. If arsenic is detected (item b) then determine the fate of arsenic in the soil and sediment samples at Eglin with respect to the following:
      - organic forms and inorganic forms
      - valence state.
2. Industrial Shop Areas:
   a. The West Branch of Tom's Creek near the Missile Maintenance sand pit (Site IS1), building 1285, should be analyzed for MEK, trichlorethylene, chrome and lead to determine the extent and significance of site contamination.

b. The drainage ditch emanating from the Electric Shop area (Site IS2), building 136, should be sampled for lead to determine the extent of dilute, neutralized battery acid drainage from the electric shop operations.

c. Obtain grab samples of drainage ditch water and soil near the Paint Shop (Site IS3), building 127, to determine the extent of contamination migration due to past paint waste discharges. The metals analyses should include cadmium, zinc, chromium and selenium.

d. Obtain grab samples of drainage ditch water and soil from the drainage ditch which was used for past disposal of electroplating solution near the Welding/Electroplating area (Site IS4), building 127. Analyses should include cadmium and cyanide.

e. Analyze samples of drainage ditch soil and water adjacent to the Allied Trades Paint Booth (Site IS6), building 90111, which was used for paint spray booth liquid waste discharge. Analyses should include cadmium, selenium, chromium, lead and zinc.

3. Waste Treatment Plants:

a. Determine RCRA Extraction Procedure Toxicity Test analyses for one representative sample of existing Hurlburt Field, Plew and Eglin Main Base waste treatment plant sludges to assess the hazardous or non-hazardous nature of these sludges. If the sludges do not contain levels of cadmium, chromium, arsenic, mercury, barium, lead, silver or selenium greater than 100 times the primary drinking water standards then past sludges should not present a potential contamination problem with regard to this study since current facilities contain more industrial type wastes than past facilities and are more likely to be a problem. The existence of metals in concentrations greater than the minimum levels noted above will require further monitoring to assess the extent of contamination at the various sludge landspread sites.

b. Hurlburt Field, Main Base, and Plew waste treatment plants' effluent discharges (holding pond) should be monitored for the 129 priority pollutants, excluding asbestos, to determine if the various spray area sites present a potential for hazardous contamination

migration. If the holding pond effluent contains priority pollutants then further monitoring of spray area monitoring wells will be required to assess the extent of contamination and potential for migration of contamination off-site.

4. Landfills:

Initiate remedial measures to close abandoned sites, regrade piles of hardfill and uncovered materials on existing landfills and vegetate appropriate sites as needed:

- Disposal pit near Skeet Range (Site D4)
- A-19 drum disposal site (Site D5)
- Field No. 2 North Landfill (Site D15)
- Field No. 2 drum disposal site (Site D30)
- Hurlburt Field hardfill area (Site D28)
- Mullet Creek disposal site (Site D9).

5. Storage Areas:

a. Analyze appropriate soil samples for DDT and PCB's at the DPDO storage yard (Site S2) to assess extent of DDT drum leakage and PCB transformer oil spillage. Initially, four core borings of one foot depth should be taken within the spill area. Each core surface sample and one foot depth sample should be analyzed for DDT or PCB's as needed. If contamination is determined from these analyses additional sampling and analysis will be required to assess the extent of contamination.

b. Analyze soil and water samples for pesticides and herbicides near the old storage shed at the CE storage yard (Site S3) to assess the extent of past drum leakage contamination.

6. County Landfills:

Additional analyses of ground-water samples from the existing monitoring wells at the Valparaiso-Niceville landfill and the Wright landfill are recommended in order to assess the potential for off-site migration of hazardous constituent contamination.

APPENDIX A

PROJECT TEAM QUALIFICATIONS

1. J. R. Absalon
2. W. G. Christopher
3. B. D. Moreth
4. E. F. Palmer
5. R. M. Reynolds

Biographical Data

JOHN R. ABSALON

Hydrogeologist

PII Redacted

[redacted]

Education

B.S. in Geology, 1973, Upsala College, East Orange, New Jersey

Professional Affiliations

Certified Professional Geologist (Indiana No. 46)
American Defense Preparedness Association
American Water Works Association
Association of Engineering Geologists
Geological Society of America
National Water Well Association

Experience Record

1973-1974 Soil Testing Incorporated-Drilling Contractors, Seymour, Connecticut. Geologist. Responsible for the planning and supervision of subsurface investigations supporting geotechnical, groundwater contamination, and mineral exploitation studies in the New England area. Also managed the office staff, drillers, and the maintenance shop.

1974-1975 William F. Loftus and Associates, Englewood Cliffs, New Jersey. Engineering Geologist. Responsible for planning and management of geotechnical investigations in the northeastern U.S. and Illinois. Other duties included formal report preparation.

1975-1978 U.S. Army Environmental Hygiene Agency, Fort McPherson, Georgia. Geologist. Responsible for performance of solid waste disposal facility siting studies, non-complying waste disposal site assessments, and groundwater monitoring programs at military installations in the southeastern U.S., Texas, and Oklahoma. Also responsible for operation and management of the soil mechanics laboratory.

1978-1980 Law Engineering Testing Company, Atlanta, Georgia. Engineering Geologist/Hydrogeologist. Responsible for project supervision of waste management, water quality assessment, geotechnical, and hydrogeologic studies at commercial, industrial, and government

John R. Absalon (Continued)

facilities. General experience included planning and management of several groundwater monitoring programs, development of remedial action programs, and formulation of waste disposal facility liner system design recommendations. Performed detailed groundwater quality investigations at Robins Air Force Base in Georgia, a paper mill in southwestern Georgia, and industrial facilities in Tennessee.

1980-Date Engineering-Science. Hydrogeologist. Responsible for supervising efforts in waste management, solid waste disposal, groundwater contamination assessment, leachate generation, and geotechnical and hydrogeologic investigations for clients in the industrial and governmental sectors.

Publications

"An Investigation of the Brunswick Formation at Roseland, New Jersey," The Bulletin, Vol. 18, No. 1, Academy of Science, State Museum, Trenton, New Jersey, 1973.

"Geologic Aspects of Waste Disposal Site Evaluations," Program and Abstracts, AEG-ASCE Symposium on Hazardous Waste Disposal, Raleigh, North Carolina, 26 April 1980.

"Practical Aspects of Groundwater Monitoring at Existing Disposal Sites," Proceedings of the EPA National Conference on Management of Uncontrolled Hazardous Waste Sites, HMCRI, Silver Springs, Maryland, 1980 (Coauthor R. C. Starr).

Biographical Data

WILLIAM GARY CHRISTOPHER

Environmental Engineer

PII Redacted

[redacted]

Education

B.S.C.E. in Civil Engineering, (Magna Cum Laude), 1974
West Virginia University, Morgantown, W.Va.
M.E. in Environmental Engineering, 1975, University of Florida, Gainesville, Florida

Professional Affiliations

Registered Professional Engineer (Georgia No. 11886)
American Society of Civil Engineers (Associate Member)
West Virginia Water Pollution Control Federation

Honary Affilitations

Chi Epsilon
Tau Beta Pi
EPA Traineeship for Master's Degree

Experience Record

1972-1974 West Virginia Department of Highways. Morgantown, West Virginia. Highway Co-op Technician. Handled inspection of drainage, concrete structures, earthwork and compaction testing for interstate highway construction within Monongalia County and Preston County. Performed field office assignments to finalize estimates and quantities for a completed section of highway construction.

1975-1977 Union Carbide Corporation, Chemicals and Plastics Division, Environcmental Engineering Department. As a process/project engineer performed environmental protection engineering for Union Carbide's Taft and Texas City Plants. Projects included process design of a rapid mix-flocculation basin for the Gulf Coast Waste

William Gary Christopher (Continued)

Disposal Authority (GCWDA) 40-Acre Facility Treatment Plant. Performed bench-scale studies of coagulant use to improve settling of aeration basin effluent biosolids at the 40-acre facility. Predicted 40-acre facility effluent BOD and effluent TSS quality following operation changes to the existing facility including addition of a limited aeration basin to the front end of the treatment plant. Performed process feasibility and conceptual design of an aeration treatment facility for Union Carbide's Texas City plant concentrated waste stream. Performed preliminary process scope and cost appraisals for sludge disposal alternatives at Texas City including: landfarming, pressure filtration-landfill and pressure filtration-incineration. Performed settling column studies for solvent vinyl resin and suspension vinyl resin waste streams and sized settling basins from the studies. Proposed bench-scale study of the effect of ethyleneamines waste stream on anaerobic treatment of Texas City concentrated wastes. Provided review assistance for a 200-acre regional industrial landfill, in-place stabilization processes for 18-acre lagoons of primary sludge and pyrolysis fuel oil mixtures at Texas City, and source reduction projects. Evaluated at UNOX compressor piping modification for the Taft Plant to reduce power consumption by 50%. Wrote preliminary operational considerations for a proposed GCWDA regional landfarm.

1977-Date Engineering-Science, Inc. Project Engineer on study for the American Textile Manufacturers Institute and EPA. Responsible for field pilot plant study and evaluation of coagulation/clarification/multi-media filtration, carbon adsorption, ozonation, coagulation/multi-media filtration and dissolved air flotation technologies for treatment of textile industry "BPT" effluents to meet future BATEA guidelines. An ancillary portion of this project included review of existing activated sludge facilities and operational practices to meet current "BPT" limits at 5 textile mill sites.

Project engineer on study for Lederle Laboratories, Pearl River, New York plant. Responsible for wastewater treatment plant evaluation and optimization study with particular emphasis on operational changes to improve performance. Treatment processes included coagulation, flocculation, primary sedimentation, oxygen activiated sludge and final sedimentation.

William Gary Christopher (Continued)

Project manager of waste treatment operations evaluation at a pharmaceutical plant. Responsibilities included operational optimization of the full-scale activated sludge process with full-scale coagulation testing, bench-scale bioreactor studies and equalization mixing and capacity studies.

Project engineer on study to determine the impact of RCRA regulations on the coal-fired utility industry. Assisted in development of design criteria and cost methodology and estimates to compare the cost impact of RCRA 3004 and 4004 regulations on fly ash, bottom ash and FGD sludge disposal on a regional and nationwide basis.

Project Manager for review of a Permit Application and design for a proposed Hazardous Waste Disposal Facility in North Carolina.

Project Manager for preparation of a "white paper" for the Department of Energy to assess major impacts of proposed RCRA 3001, 3004 and 3006 regulations on industrial coal use for power generation.

Project Manager on study to determine biotreatability of new process wastes for a pharmaceutical chemical plant and to evaluate and define options for liquid waste incineration.

Project Manager on odor control study of process wastes for a major organic chemicals company. Responsible for laboratory bench-scale and field pilot plant study involving evaluation of liquid waste, air and steam stripping, chemical oxidation, ozonation, and activated carbon adsorption. Design criteria for a biological treatment system for the odor pretreatment effluent was also developed from bench-scale bioreactor studies.

Project Manager on a study to provide a preliminary evaluation of advanced waste treatment technologies required for upgrading an existing activated sludge facility treating organic chemical and pharmaceutical wastes with high COD and nitrogenous concentrations.

Project Manager on a biological treatability study to provide expanded waste treatment facilities for a major organic chemicals firm. Responsibilities included laboratory bench-scale and pilot scale treatability and sludge handling studies involving waste characterization, activated sludge treatability, aerobic digestion, gravity thickening, dissolved air flotation, belt filter press sludge dewatering, plate and frame pressure

William Gary Christopher

filter, vacuum filter (rotary precoat), and centrifugation for nine different raw waste streams.

Project Manager for a project involving process selection and preliminary engineering design for a pulp and paper mill waste treatment facility.

Project Manager on Solid and Hazardous Waste study for a diverse chemicals and plastics production facility. Responsibilities included RCRA Interim Status Compliance, RCRA Manifest Implementation and plant training, RCRA Notification and Permit Part A applications. Detailed Solid Waste inventories by production unit and classification of wastes according to RCRA were developed. Segregation of wastes, recycle/recovery and ultimate disposal options including incineration and secure landfills were evaluated for the short-term. Long-term evaluations will be considered in Phase II of the Study.

Project Manager on Solid and Hazardous Waste study for a diverse organic chemicals manufacturing facility. Long-term alternatives for storage, handling, treatment and disposal of a variety of types of hazardous wastes were evaluated based on technical performance and economic comparisons. Alternatives evaluated included solid and liquid incineration, landfill, landfarm, solidification/fixation, and physical volume reduction (shredding,compaction).

Project Manager for a waste treatment plant capacity evaluation for a silicon wafer manufacturing facility. Bench-scale and pilot scale coagulation and settling column studies were performed in addition to field scale oxygen transfer tests to predict maximum design organic and hydraulic loadings for an existing activated sludge waste treatment facility.

Other recent projects include development of the work plan and experimental program for an American Cyanamid Company organic chemical plant primary treatment study, development of design specifications for a pharmaceutical production facility waste treatment plant and mixed liquor coagulation operations assistance for a plastics production waste treatment facility.

Technical Publications

"Magnesium Recovery from a Neutral Sulfite Semi-chemical Pulp and Paper Mill Sludge," Master of Engineering Research Project, University of Florida, Gainesville, Florida 1975.

William Gary Christopher

"Siting Considerations for Hazardous Waste Disposal Facilities," presented at the Georgia Environmental Health Association Conference, Jekyll Island, Georgia, July, 1981. (Co-author T.N. Sargent)

W. G. Christopher, "Hazardous Waste Management," Seminar presented to Capitol Associated Industries, Inc., Raleigh, North Carolina, August 21, 1981

W. G. Christopher, "A Solid and Hazardous Waste Management Program for Industrial Facilities," Industrial Wastes Magazine (publication pending), 1981.

Biographical Data

BRIAN D. MORETH

PII Redacted

Environmental Scientist

[redacted]

Education

B.S. in Forest Science, 1971 and B.S. in Zoology, 1971, Pennsylvania State University, University Park, Pennsylvania
Wildlife Management (graduate studies), Pennsylvania State University, University Park, Pennsylvania

Professional Affiliations

American Fisheries Society
Society of American Foresters
Wildlife Society

Honorary Affiliations

Phi Epsilon Phi
Phi Sigma
Xi Sigma Phi

Experience Record

1971-1973 Pennsylvania Cooperative Wildlife Unit. Research Assistant. Participated in wildlife research studies and in the design and implementation of public land use surveys. Cover mapped a parcel of state game lands by means of aerial photography and prepared suggestions for land management. Conducted research on the vegetative preferences of the ruffed grouse. Presented public lectures to organized groups and schools.

1973-1980 Buchart-Horn, Inc., Environmental Division, York, Pennsylvania. Project Scientist. Researched, prepared, and supervised aspects of environmental studies dealing with wildlife, fishery, forestry, and land use. Coordinated preparation of various environmental impact statements.

Prepared natural resource inventories for proposed sewer and highway construction areas and assessed possible impacts. Participated in evaluation of alternative sewage disposal systems. Coauthored a trout hatchery feasiblity

Brian D. Moreth (Continued)

study of facilities for the State of New Jersey, and prepared revegetation plans for reservoir and strip mined lands.
Served as Task Force Leader for the Environmental Quality segment of Comprehensive Water Quality Management Plan for a seven-county area in northeast Pennsylvania, which involved preparing an inventory of all natural resources and environmentally sensitive and degraded areas.

1974-1980 Pennsylvania Game Commission, York County, Pennsylvania (concurrent position). Deputy Game Protector. Responsible for enforcement of game, fish, forestry, and park laws of the Commonwealth of Pennsylvania. Assisted in public presentations including instruction of Hunter Safety Courses.

1980-Date Engineering-Science. Project Scientist. Involved in the development of environmental studies, inventories, and evaluations for municipal, industrial, and Federal government projects.
Served as Deputy Project Director of a third-party EIS for a central Florida phosphate mine. This involved preparation, direction and coordination of the multiple environmental facets associated with the construction of a new mine.
Served as Project Scientist for site and record searches of several Air Force Bases evaluating hazardous waste disposal and any biological effects associated with it.

Assisted in development of a peat mining and restoration plan for a private concern in North Carolina.

Biographical Data

ERIC F. PALMER

Environmental Engineer/Chemist

PII Redacted

[redacted]

Education

B.S. in Chemistry (Cum Laude), 1975, Clemson University, Clemson, South Carolina

Milliken & Co. Management Orientation Course, 1976

M.S. in Environmental System Engineering, 1979, Clemson University, Clemson, South Carolina

Professional Affiliations

American Chemical Society
Water Pollution Control Federation
Georgia Water Pollution Control Association

Honorary Affiliations

Sigma Tau Epsilon Honor Society

Experience Record

1975-1977 Milliken & Co., Excelsior Finishing Plant #2, Pendleton, S.C. First Line Production Supervisor. Responsible for managing a shift of up to twelve hourly employees involved with the preparation and face finishing of textured woven polyester.

1977-1978 Clemson University Environmental Systems Engineering Department, Clemson, S.C. Graduate Research Assistant under EPA funding. Responsible for an investigation into heavy metal and organic priority pollutant removal from dye manufacturing waste streams. Coordinated and conducted a two-week stream survey of Golden Creek in Easley, S.C. Developed computer programs in Fortran, PLI and CSMPX programming languages including a two-dimensional finite volume water quality model and a continuous type water quality model.

ERIC F. PALMER (Continued)

1978-Date Engineering-Science, Inc. Project Engineer on evaluation of feasible alternatives for alkaline waste neutralization facility. Project Engineer on formulation and evaluation of short-term and long-term alternatives for process odor control in a textile finishing plant.

Project Engineer responsible for conduct and evaluation of bench-scale activated sludge treatability study with PAC enhancement for future wastewater to be generated at the General Electric plastics plant in Selkirk, New York. Developed process design parameters for the proposed expanded facility.

Project Engineer on study for the American Textile Manufacturers Institute and EPA. Responsible for conduct and evaluation of pilot scale activated sludge treatability study with PAC enhancement. Pilot plant studies were conducted at a Subcategory IV textile finishing plant. Evaluated the feasibility of PAC enhanced activated sludge technology for meeting future BATEA guidelines.

Project Engineer responsible for developing and implementing an odor control evaluation program for alkaline neutralization facility at the American Cyanamid Bound Brook, New Jersey plant, chemicals division. Technologies investigated included wet-scrubbing, chemical oxidation and carbon adsorption.

Project Manager for bench-scale treatability study to evaluate the feasibility of upgrading existing waste treatment facilities with the addition of an oxygen limited aerobic lagoon at the Monsanto Company, Decatur, Alabama textile products plant. Evaluated the feasibility of selectively treating one process wastestream versus treating the total wastestream. The bench-scale study included an investigation of low temperature effects on the system and the impact of aerobic lagoon treatment on the downstream activated sludge process. Developed process design parameters for the proposed waste treatment plant expansion.

Project Engineer responsible for determination and evaluation of background odors and noise on a future brewery site environmental impact assessments study.

Project Engineer responsible for the design and conduct of odor reduction procedures for wastestreams containing organic reduced sulfur compounds. Also responsible for the formation and implementation of an odor panel. Technologies investigated include air and steam stripping, ozonation, chemical oxidation with hydrogen peroxide, sodium hypochlorite and potassium permanganate. The study included

ERIC F. PALMER (Continued)

characterization of both liquid and gaseous wastestreams, and the characterization of bioreactor off-gases for odor intensity and odor reduction. Developed process control strategies for the determination of the quantity of chemical oxidant necessary for odor reduction or elimination. Used a gaussian line source model to predict the distance from a waste treatment aeration basin where potential odor problems would exist.

Project Engineer responsible for conduct and evaluation of bench-scale activated sludge and aerated lagoon treatability studies to evaluate the compatability of a textile fiber production wastewater with a proposed agricultural chemical production process wastestream. Developed process design parameters for modifications to the existing facility to accommodate the proposed agricultural process wastestreams.

Project Engineer responsible for all technical phases of a UNOX and pure oxygen activated sludge biological treatability study on wastewater from a General Electric plastics manufacturing facility. Project involvement included designing and constructing the bench-scale 4-stage UNOX reactor, setting up the experimental program including shock-load testing, microscopic evaluation of the biopopulation and biokinetic evaluation, data evaluation and the development of process design criteria.

Project Manager responsible for the evaluation of present clarifier capacity at a textile chemical production facility. Conducted batch flux settling tests on mixed liquor and evaluated various polymers for their ability to improve the settling characteristics of the mixed liquor.

Project Manager responsible for developing a computer-assisted activated sludge-aerated lagoon waste treatment facility process control package. Activities included defining all pertinent control strategies for an aerated lagoon pretreatment basin followed by three parallel activated sludge systems. The control strategies were then developed into a set of copywrite-protected near-real time microcomputer process control programs. Other activities included conducting operator training on both the operation of the computer programs, on biological treatment fundamentals, and proper operation of the wastewater treatment facility. The computer programs included data management, waste solids control, aerated lagoon flow splitting, secondary clarifier control (batch flux technique) and various file building and calculation assist programs.

Project Manager responsible for evaluating the solids handling facility at a textile chemical production facility.

ERIC F. PALMER (Continued)

Investigated dissolved air flotation, gravity thickening, aerobic digestion, and odor control during sludge spraying. Developed process design criteria for the solids handling facility and also developed an operating strategy manual for the solids handling facility.

Project Engineer responsible for developing conceptual process design information for a 5 MGD activated sludge facility at a dye manufacturing plant. Responsibilities included stormwater peak runoff calculations, stormwater impoundment requirements, equalization basin sizing, spill diversion, neutralization facility chemical selection and dosage requirements and resulting sludge production, primary clarification, biological system sizing including aeration testing and temperature effects on the biological system. Defined the conceptual process flow sheets and combined this information into a report submitted for regulatory considerations.

Project Manager responsible for the development of near-real time waste treatment process control microcomputer software for an agricultural chemical production facility. Activities included defining pertinent control strategies, developing computer software, system implementation, operator and process engineer training, key operating procedures manual development and facility start-up assistance. The computer software included data management, influent organic load prediction including production process influences, spill and equalization evaluation, biological solids control, secondary clarifier control, chemical feed control and graphic representation of wastewater treatment plant status. The computer system was configured around an Apple II^R with a communication linkage to a DEC 11/70 RSTS/E system.

Publications

Palmer, E. F. , "Organic Priority Pollutant Removal from Dyestuff Manufacturing Wastewater," Masters special problem report, Clemson University, Clemson, S.C., August, 1979.

Hockenbury, M. R., and Palmer, E. F., "Microcomputer Assisted Treatment Facility Operation," presented at 49th Annual Georgia and Water Pollution Control Association Conference, Jekyll Island, Georgia, August 1980.

Palmer, E. F., and Hockenbury, M. R., "Microcomputer Applications in Industrial Waste Water Treatment," presented at 36th Annual Purdue Industrial Waste Conference, Purdue University, West Lafayette, Indiana, May, 1981.

Biographical Data

RANDAL M. REYNOLDS

Senior Engineer

PII Redacted

[redacted]

Education

BChE (Chemical Engineering), 1973, Georgia Institute of Technology, Atlanta, Georgia

Professional Affiliations

Registered Professional Engineer, Georgia #13023
Air Pollution Control Association
American Institute of Chemical Engineers (chapter secretary)

Experience Record

1973-1975 U.S. Environmental Protection Agency, Water Enforcement Branch, Atlanta, Georgia. Chemical Engineer. Responsible for developing draft NPDES limitations for industrial discharges, issuing public notices and final NPDES permits and participated in public hearings concerning NPDES permits.

1975-1981 Gold Kist Inc., Corporate Engineering Department, Atlanta, Georgia. Environmental Process Engineer. Responsibilities included reviewing and implementing new air quality, NPDES, RCRA and TSCA regulations. Supervised preparation and submittal of air quality, water quality and hazardous waste permit applications. Kept management informed of new regulation impacts on existing and future projects. Also provided preliminary designs for air pollution control systems and cost estimates for air quality capital projects. Developed specifications for pump systems and related unit operations.

1981-Date Engineering-Science, Inc., Atlanta, Georgia. Senior Engineer. Responsibilities include developing solid and hazardous waste disposal site studies and alternative evaluations for waste disposal methods. Provide in-plant expertise for process waste evaluations and recommendations. Provide assistance to project teams concerning industrial wastewater treatment and permitting.

RANDAL M. REYNOLDS (Continued)

Publications

R.M. Reynolds, "Practical Tips - Bagging Sludge?", Pollution Engineering, Vol. 12, No. 7, July 1980, pg. 28.

R.M. Reynolds, "Pulse-Type Fabric Filters in a Soybean Processing Facility," Operation and Maintenance of Air Particulate Control Equipment, R.A. Young, F.L. Cross, Jr., editors, Ann Arbor Science Publishers, Inc., Ann Arbor, Michigan, July 1980, pp. 121-123.

APPENDIX B

INSTALLATION HISTORY

APPENDIX B

INSTALLATION HISTORY

In 1931, the commandant of the Air Corps Tactical School at Maxwell Field, Ala., began surveys to find a satisfactory site for a bombing and gunnery range for his students.

It was the custom during that period for Air Corps officers stationed at Maxwell to spend their weekends at Valparaiso, Fla., enjoying the beaches and sun. Because the area was sparsely populated and adjacent to the vast Gulf of Mexico, Capt. Arnold H. Rich and his fellow weekenders recognized the potential of the area for testing. With the support of several local inhabitants, the site at Valparaiso was selected for use by the Tactical School.

On June 14, 1935, the Valparaiso Bombing and Gunnery Range was activated on land donated by James R. Plew, a Valparaiso resident. A detachment of 15 enlisted men under the command of Captain Rich manned the sub-post of Maxwell Field.

On August 4, 1937, the Valparaiso Base was redesignated Eglin Field in honor of Lt. Col. Frederick I. Eglin, an Army Air corps aviator who was killed in the crash of his aircraft near Anniston, Ala., on January 1, 1937.

With the outbreak of World War II, Eglin became a primary center for testing aircraft, equipment and tactics. It was the site of training for the famous "Doolittle Raid" against Imperial Japan, and was instrumental in studying and working out a way to destroy the German V-1 rockets used against England.

Eglin became an important missile test center with the addition of an over-water test range in 1961. Important research and development has included work with the BOMARC missile, laser-guided missiles, and the tactics of "special operations."

During the Vietnam Conflict, Eglin was the training site for the Son Tay Raiders, the group which made a daring attempt to rescue

American POWs from a North Vietnamese prison camp. In 1975, Eglin was one of the four main Vietnamese Refugee Receiving Centers, housing and processing more than 10,000 refugees at its Field Two "Tent City."

Because of the successful processing of Vietnamese refugees, in 1975 at Eglin AFB after the fall of Vietnam at the end of April 1975, the U.S. Government decided that Eglin would also be a suitable locale to process the Cuban refugees. Camp Libertad was established in May of 1980 at the Fort Walton Beach Fairgrounds. This undertaking was pronounced "Operation Red, White and Blue." The personnel at Eglin, the other services, and civilian agencies responded to process more than 10,000 cuban refugees.

APPENDIX C

ENVIRONMENTAL SETTING

APPENDIX C

ENVIRONMENTAL SETTING

GEOGRAPHY

Eglin Air Force Base straddles three major physiographic regions of Northwest Florida: the Western Highlands, the Gulf Coastal Lowlands and the Gulf Barrier Island Chain (refer to Figure C.1). The Western Highlands are a relatively high geomorphologic feature composed of generally coarse-grained alluvial and fluvial unconsolidated materials of Plio-Pleistocene age (Scott, et al, 1980; Vernon and Puri, 1964; etc.) hilltops tend to be well rounded and slopes are steep and well developed by stream dissection. The Gulf Coastal Lowlands form a southward sloping feature of little relief extending along much of the Southern Florida Panhandle. The lowlands are primarily composed of reworked marine and estuarine sediments of Recent and Pleistocene age (Vernon and Puri, 1964). The Gulf Barrier Chain is a fine-grained linear sedimentary feature composed of sand dunes, beach ridges and wave cut bluffs exhibiting little variation in relief (Trapp et al, 1977).

Topography

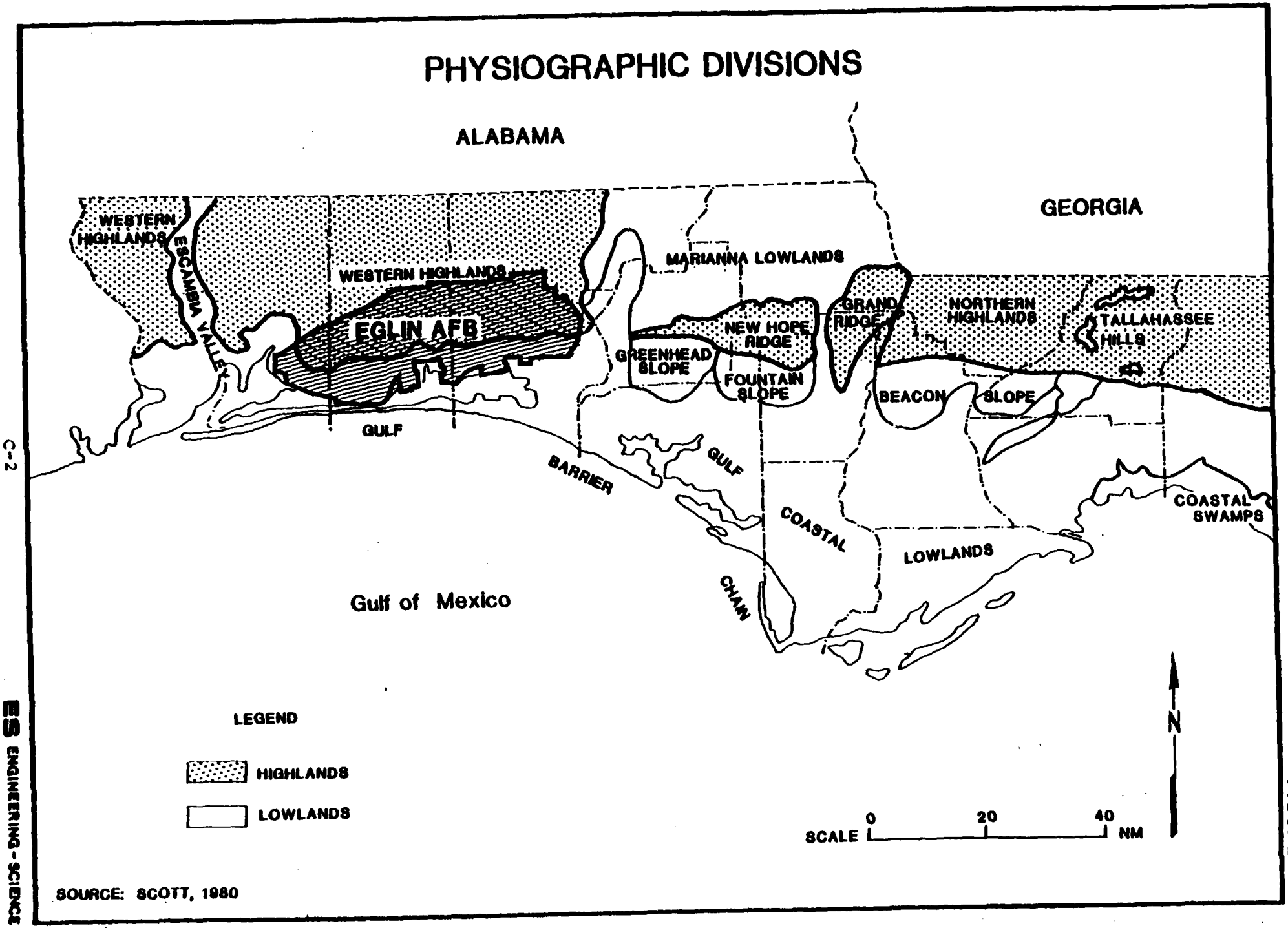
Topographic relief at Eglin Air Force Base varies from sea level along Choctowhatchee Bay to 292 feet in the northeast quadrant of the installation. Typical elevations are as follows:

Western Highlands:	200 feet (hilltops)
Coastal Lowlands:	60 feet (Eglin Main)
Barrier Chain:	10 feet (beaches)

Transitions in relief occur gradually, creating an appearance of southern lowlands bordered to the north by gently rolling hills.

Drainage

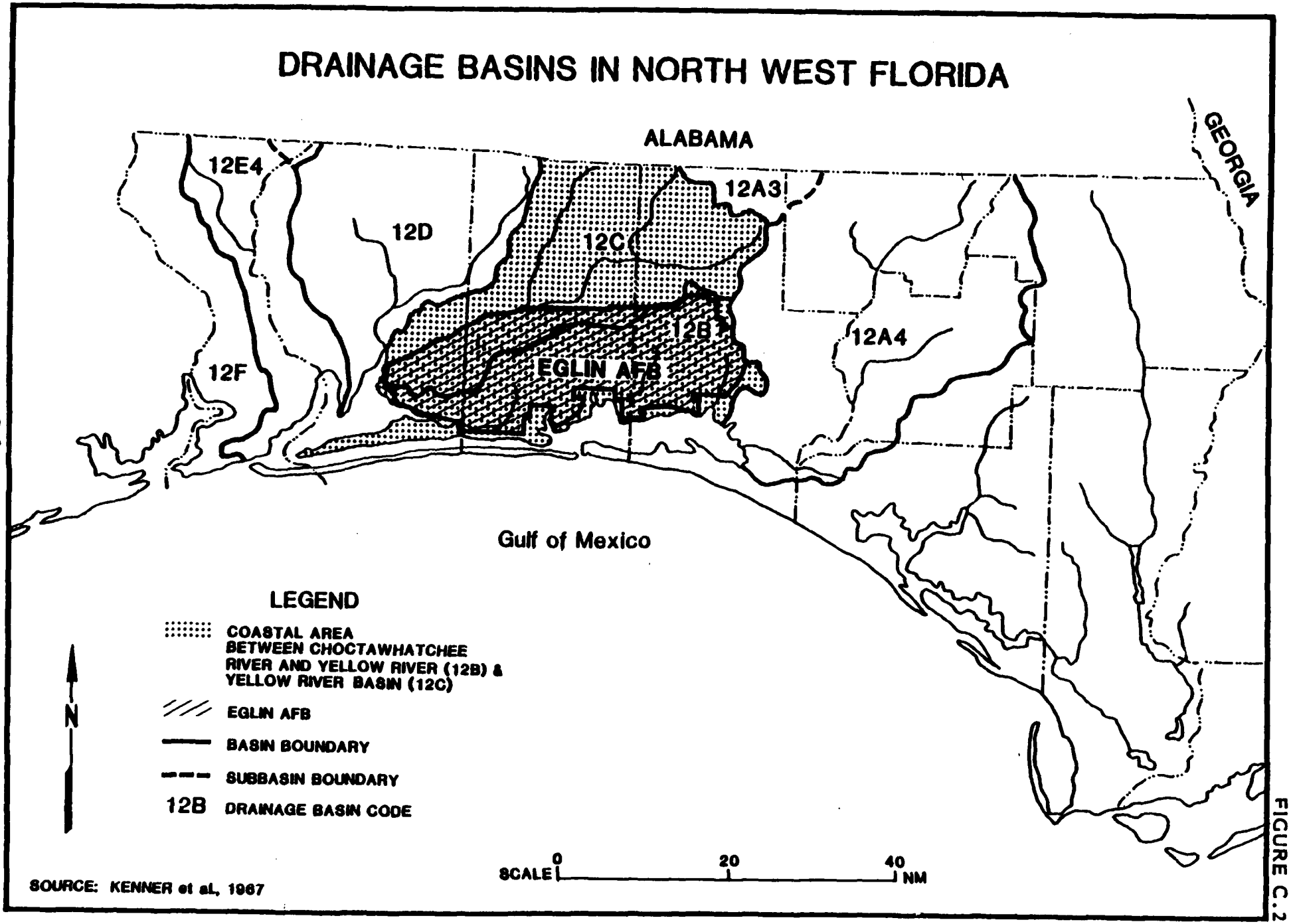
Eglin Air Force Base occupies segments of two major drainage basins (refer to Figure C.2). The northern portion of the installation is situated within the limits of the Yellow River Basin which has an area of some 1,369 square miles. The southern portion of the installation



C-2

ES ENGINEERING - SCIENCE

FIGURE C.1



ES ENGINEERING - SCIENCE

FIGURE C.2

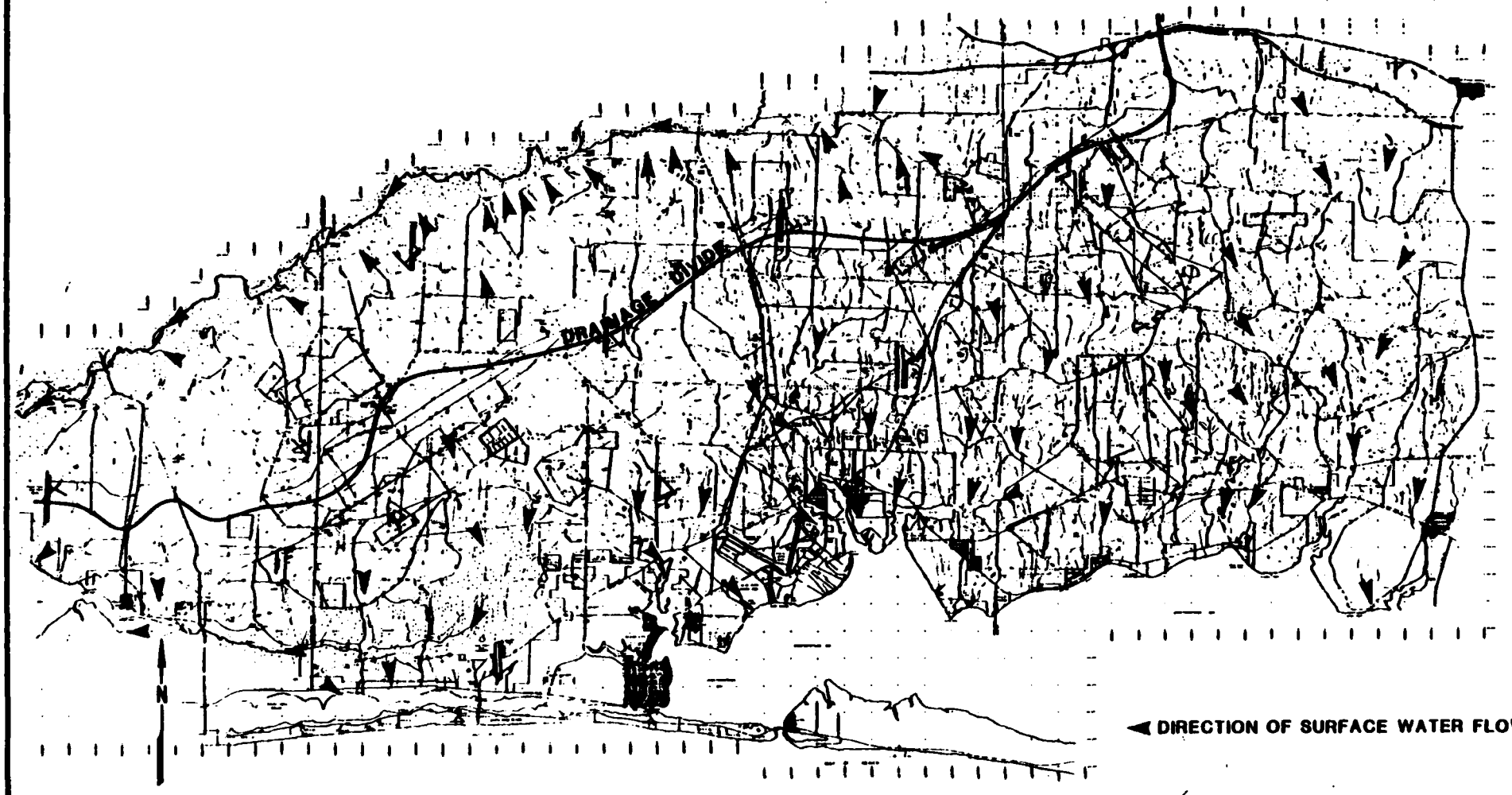
drains to the Coastal Area between the Choctawhatchee and Yellow Rivers. The drainage boundary dividing the two basins roughly corresponds to the upper elevations of the Western Highlands Physiographic Region and extends across the installation from East Bay eastward to the vicinity of DeFuniak Springs. The major stream draining the Yellow River Basin is the Yellow River (Figure C.3). Tributary stream flow to the Yellow extends northward from the basin divide to the river in a generally trellis pattern. In contrast, no single major stream has developed in the Coastal Area Basin. Numerous small streams extending southward from the divide have developed a pronounced dendritic drainage pattern (Figure C.3). The one major exception to this rule seems to be the East Bay River, which drains westerly to the East Bay and has developed a somewhat braided appearance in the back bay swamps where it joins its major tributaries, Liveoak and Turtle Creeks. Shoreline development augmented by numerous changes in sea level stands appears to have caused this modification in local surface drainage.

River swamps have developed in the flood plains of the Yellow and Shoal Rivers and of Titi Creek, due to the accumulation of sediments locally, creating natural levies. Runoff from surrounding upper elevations becomes temporarily impounded, draining off slowly. During floods, the levies will be breeched, temporarily flooding the river swamps. Swamps and poorly drained flatwoods have formed on the remnants of marine terraces in the Coastal Area Basin. In depressed areas underlain by limonite-cemented sands ("hardpan") the downward movement is restricted, creating such features as small lakes and the East Bay Swamp (Trapp, et al, 1977).

Stream flow has been defined hydrologically as the sum of direct runoff and base flow. Direct runoff is highest where topography, surface soils and vegetation restrict the percolation of waters. In this case, direct runoff tends to be low and stream flow volumes and velocities may exhibit modest seasonal variations with rainfall. Base flow tends to be high in areas such as that occupied by the installation. Sandy surface soils and relatively flat topography favor the infiltration of rainwaters, while limiting runoff (Figure C.4). Once rainfall infiltrates into surface soils, it is held in temporary storage, then slowly and consistently discharged as ground-water seepage

EGLIN AFB

SURFACE WATERS



SOURCE: INSTALLATION TOPOGRAPHIC MAPS

FIGURE C.3

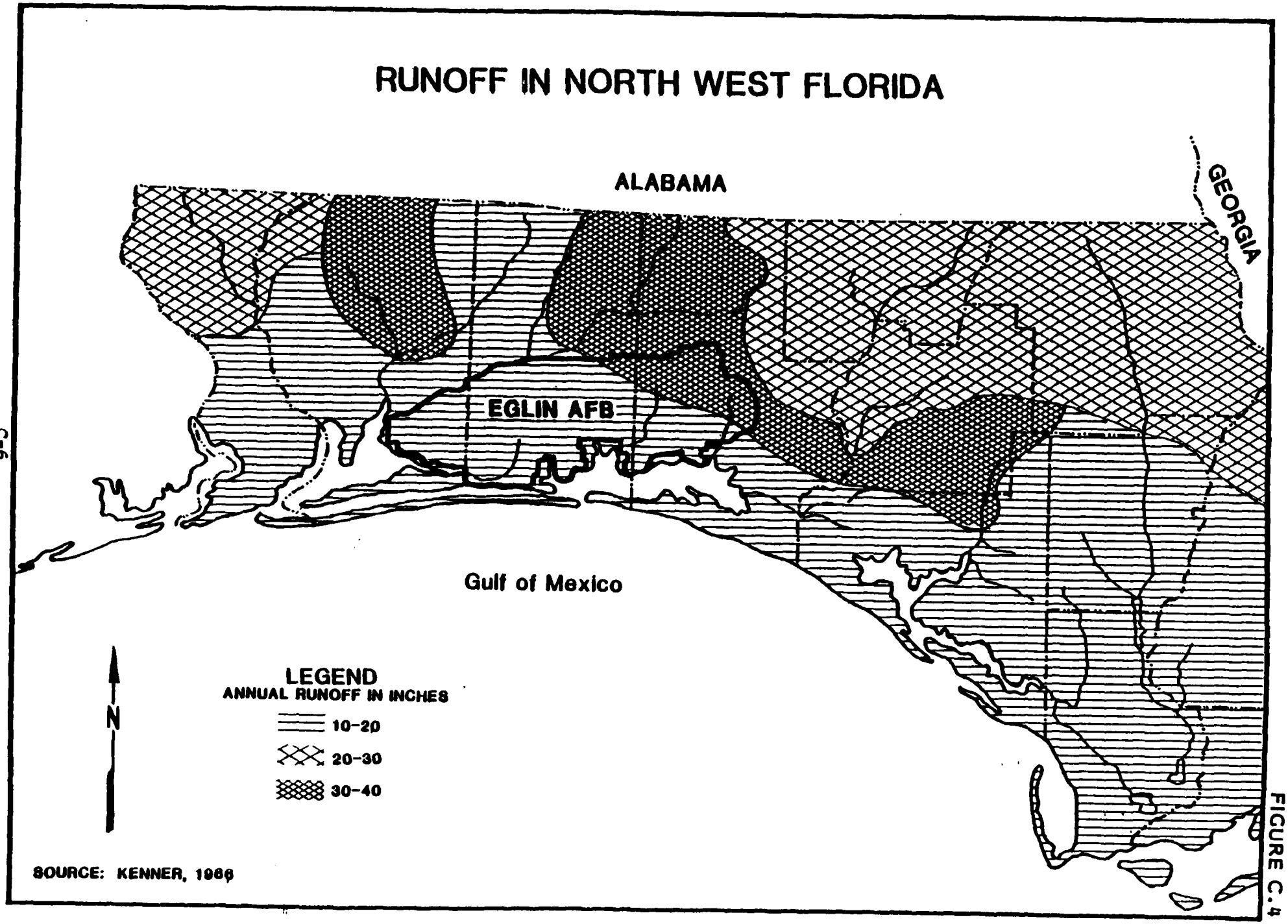

RUNOFF IN NORTH WEST FLORIDA
ALABAMA
GEORGIA
EGLIN AFB
Gulf of Mexico
N
LEGEND
ANNUAL RUNOFF IN INCHES
10-20
20-30
30-40
SOURCE: KENNER, 1966

FIGURE C.4

or base flow to streams. According to Trapp, et al (1977), 48 to 96 percent of total stream flow in Okaloosa County is comprised of base flow (Table C.1). The remainder is comprised of runoff. This is indicative of the relatively consistent stream flow observed in Northwest Florida streams (Table C.2). In addition, the relatively flat stream flow duration curves developed as a part of Trapp's study indicate that the basins store large quantities of ground water in surficial aquifers.

Flooding is not normally a significant problem for Okaloosa County and surrounding areas. Three major factors combine to limit flooding:

1) Actual flood events are normally confined to stream channels.
2) Development within flood plains has not significantly encroached on flood plain storage.
3) Soil types prevalent in the study area permit rapid infiltration and a large ground-water reservoir dampens peaks and increases the length of the runoff period.

Surface Geology

The surficial geology of Eglin Air force Base is summarized (Schmidt, 1978) as four distinct units (refer to Figure C.5):

1) Coarse sand and gravel (Citronelle Formation)
2) Clayey sand
3) Sandy clay and clay
4) Fine to medium sand and silt (Alluvium and Marine Terrace deposits.

The Late Pliocene Age Citronelle Formation covers upland areas of Northwest Florida. It is comprised of well sorted to poorly sorted quartz sands and gravels of terrestrial origin. Clay beds may be present locally. As the grain size and relative abundance of the gravel fraction decreases from northwest to southeast, a northwestern sediment source is indicated. The distribution and character of the Citronelle suggest that this is a deposit formed by the coalescence of ancient rivers terminating at the Gulf of Mexico. The sediments tend to be deeply weathered, and the formation is of variable thickness due to the variable nature of the pre-Citronelle base and modern stream dissection.

Clayey sand deposits have been mapped as fairly isolated occurrences. These deposits may be an expression of a secondary lithology of

TABLE C.1

TOTAL RUNOFF, BASE RUNOFF, AND PERCENTAGE OF BASE RUNOFF AT SELECTED GAGING SITES FOR THE 1967 WATER YEAR.

Annual Rainfall Averages 65 Inches at Niceville (Period of Record: 1939-1967)

Gaging station (Locations shown on figure 7)	Total runoff (inches)	Base runoff (inches)	Base runoff as percent of total runoff
Rocky Creek near Niceville	33.50	29	87
Turkey Creek near Niceville	39.37	38	96
Juniper Creek near Niceville	30.21	27	89
East Bay River near Wynnehaven Beach	44.14	33	75
Baggett Creek near Milligan	26.18	22	85
Shoal River near Mossy Head	16.14	13	81
Pond Creek near Dorcas	14.51	7	48
Titi Creek near Crestview	24.35	20	82

Source: Trapp et al, 1977

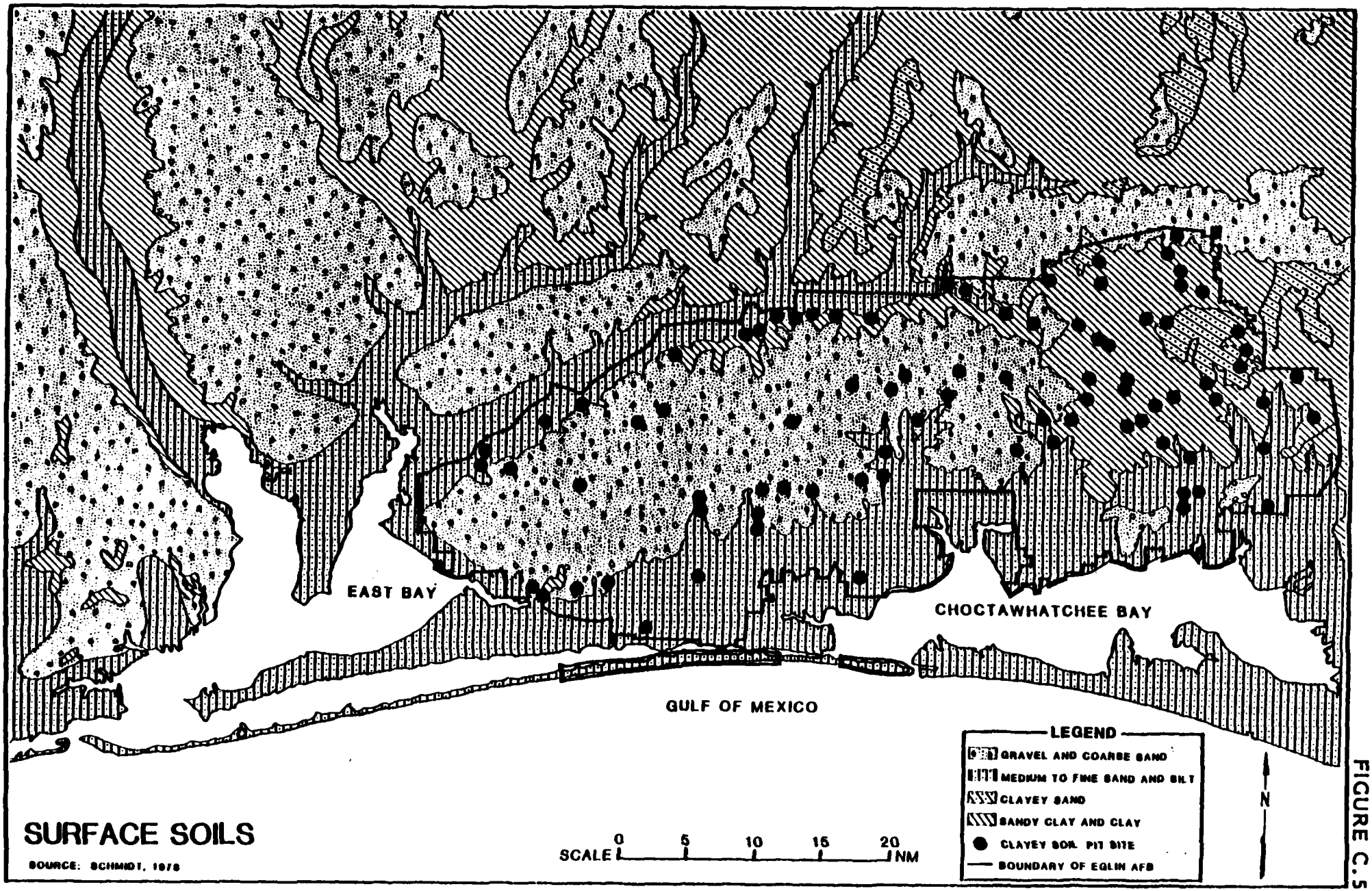
TABLE C.2

SUMMARY OF STREAMFLOW DATA IN OKALOOSA COUNTY AND ADJACENT AREAS

Gaging station (Locations shown on figure 7)	Drainage area (mi^2)	Period of record used	Average annual runoff (inches)	Average discharge			Maximum discharge (ft^3/s)	Minimum discharge (ft^3/s)
				(ft^3/s)	[(ft^3/s)/mi^2]	(Mgal/d)		
Rocky Creek near Niceville	67.0	a 1966-68	38	185	2.76	120	1,100	102
Turkey Creek near Niceville	25.0	a 1966-68	43	78.7	3.15	50.8	224	56
Juniper Creek near Niceville	29.5	a 1966-68	36	77.6	2.63	50.1	507	39
East Bay River near Wynnehaven Beach	62.0	a 1966-68	46	208	3.35	134	1,440	119
Yellow River at Milligan	624	1939-67	25	1,136	1.73	696	28,000	136
Baggett Creek near Milligan	7.8	1964-67	38	21.9	2.81	14.1	368	7.8
Shoal River near Mossy Head	123	1952-67	26	232	1.89	150	10,500	42
Pond Creek near Dorcas	94.8	b 1966-68	c 15	113	1.19	73.0	2,500	12
Titi Creek near Crestview	62.9	a 1966-68	29	134	2.13	86.6	1,450	69
Shoal River near Crestview	474	1939-67	31	1,077	2.40	734	21,700	253
Yellow River near Holt	1,210	1933-41 1966-68	d 27	d 2,400	1.98	1,550	--	--
Blackwater River near Baker	205	1951-67	20	300	1.46	194	17,200	72
Blackwater River near Holt	276	1966-68	d 19	d 380	1.38	245	--	--

a May 1966 to April 1968 (24 months)
b October 1966 to April 1968 (19 months)
c October 1966 to September 1967 (12 months)
d Estimated

Source: Trapp et al, 1977



SURFACE SOILS

SOURCE: SCHMIDT, 1978

FIGURE C.5

ES ENGINEERING - SCIENCE

the Citronelle formation which may have been reworked by changing sea level stands. The distinction between clayey sand and sandy clay deposits is often difficult to predict as lateral changes occur gradually in lithology and their distribution is irregular.

The sandy clay and clay unit has been mapped over a wide area, and usually underlies hills capped by the Citronelle. The sandy clay units are present in two forms: the first is a massive, plastic clay with small amounts of quartz sand present. The second tends to be mottled in appearance, is less plastic or non-plastic and contains a larger sand fraction. The clays are usually kaolinitic. The first type described is mined for use in brick manufacturing. Exposed beds are typically one to ten feet thick, with one measured exposure near the Escambia River being over 40 feet in thickness.

The Recent to Pleistocene fine to medium sand and silt unit is confined to stream valley and marine terraces. It is alluvial in origin, is less consolidated than comparable Citronelle deposits, contains little or no gravel and clay-sized particles. Coastal areas and stream valleys typically contain small accumulations of heavy metals. Repeated landward intrusions by the sea have reworked the character and lithology of this unit, obscuring the delineation between terrace and Citronelle deposits.

Soils

Installation soils have been studied during numerous subsurface investigations supporting geotechnical (structural foundation) studies and by the Soil Conservation Service, USDA (1969) during a mapping project requested by the Air force. A records search conducted at the Base Civil Engineer's offices (Building 666) as a part of this contract, revealed that few, if any, soil engineer's reports remain on file, even for major base structures.

Five soil associations have been mapped at Eglin Air Force Base.

1) St. Lucie-Paola Association
2) Lakeland Association
3) Troup-Lakeland Association
4) Chipley-Lakeland-Rutledge Association
5) Dorovan-Pamlico Association.

All the associations listed, except the Dorovan-Pamlico, are com-

posed of acidic, deep sandy soils that are excessively drained with depths to fine-textured materials reaching 80 inches. The Dorovan-Pamlico consists of organic clays overlying sands that are poorly drained. Table C.3 summarizes soil association information. The Installation Soils Association Map is presented as Figure C.6.

Subsurface Geology

Eglin Air Force Base is situated in the Coastal Plain, the geology of which consists of unconsolidated sediments and sedimentary rock ranging in age from Cretaceous to Recent. Coastal Plain deposits begin at a northward margin (extending from Alabama to Maryland) known as the Fall Line and extend southward as a homoclinal wedge, resting on tilted Appalachian Complex basement rocks, to the Gulf of Mexico. At the Fall Line, the sediments have a thickness measured in inches. While at their southern margin their total thickness may approach 30,000 feet (Marsh, 1966). The reason for this phenomenom is that the U.S. Gulf Coast represents the landward margin of one of the most active geosynclines (a basin receiving sediments) in North America. Eglin AFB is located on the north flank of the Gulf Coast Geosyncline and also on the east flank of a second major structural feature, the Mississippi Embayment, a depression in the underlying basement rocks. Because of these two major structural features, all the formations in the Eglin AFB area exhibit a characteristic southwestward dip, which apparently extends to the base of the Cretaceous Series (Marsh, 1966). Typically, unconsolidated formations present in the Eglin area are thinner to the east (Walton County) and thicken substantially toward the west (Santa Rosa County). (Refer to Section D-D', Figure C.10).

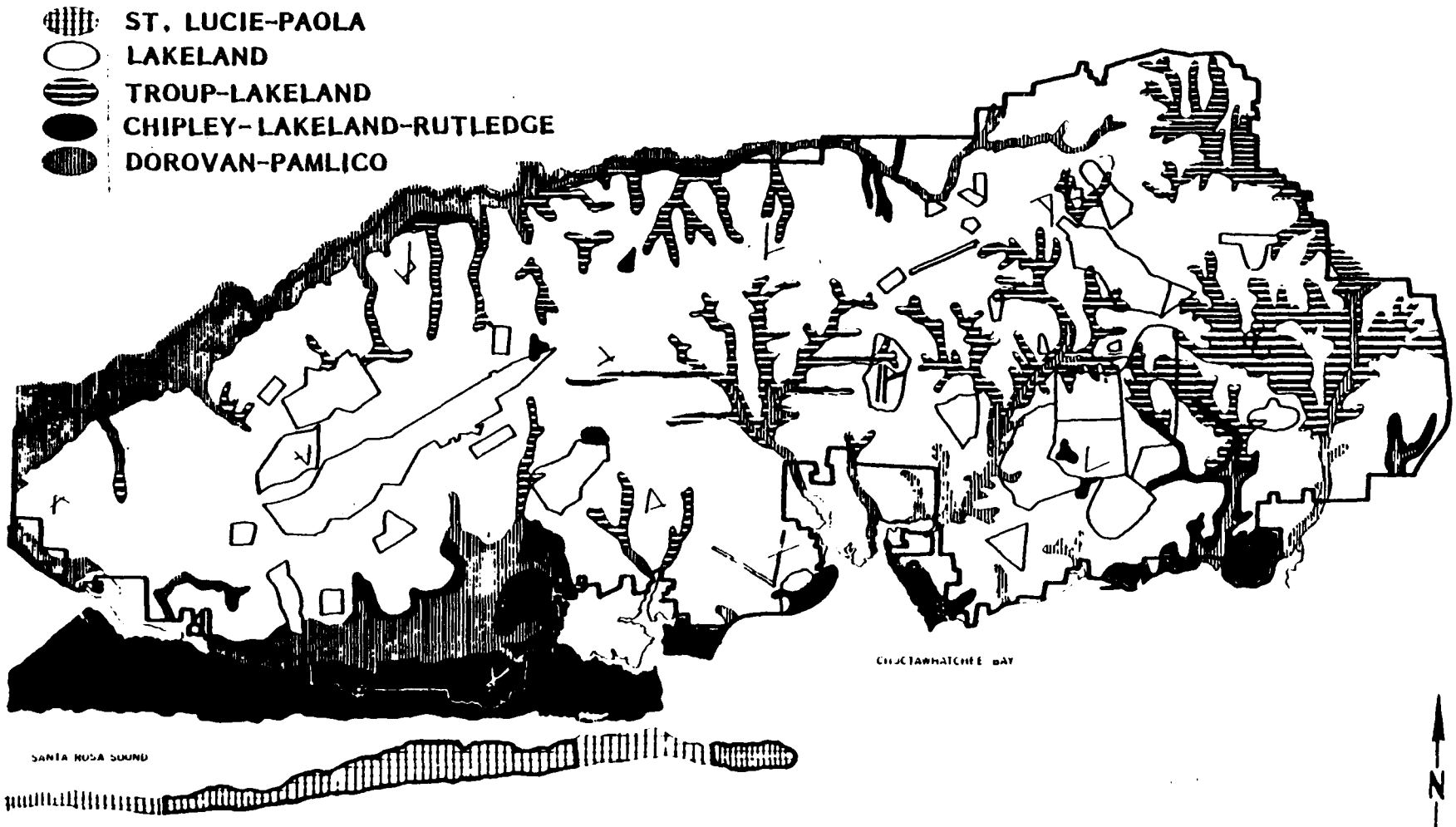
Faults in geologic strata have been mapped in northern Santa Rosa County and near Milton, Florida, however, none are presently known to exist within the limits of Eglin Air Force Base. Faults mapped off-base are not believed to present any future adverse impacts to base activities. Seismic activity is virtually unknown in Florida, however, it is possible that some effects may be felt locally from earthquakes occuring at some distance in adjacent states. If such effects were felt locally from a distant earthquake, it is unlikely they would present a threat to property or human life.

TABLE C.3

SOIL ASSOCIATION INFORMATION

	Association (Soil Type)	Base Area (Percent)	Maximum Thickness (inches)	Slopes	Drainage	Usage	Remarks
(1)	St. Lucie - Paola	2	80	Gentle to Steep	Excessive	Recreational-coastal beaches	Low fertility
(2)	Lakeland	78	80	Flat to Steep	Excessive	Woodlands, light building loads	Low fertility
(3)	Troup-Lakeland	10	75	Gentle to Steep	Excessive	Woodlands	Poor traffic-ability
(4)	Chipley-Lakeland-Rutledge	4	80	Flat to Gentle	Moderate	Woodlands	Water table varies
(5)	Dorovan-Pamlico	6	60	Level	Poor	Wildlife	Water at surface 9+ months/year

SOIL ASSOCIATIONS

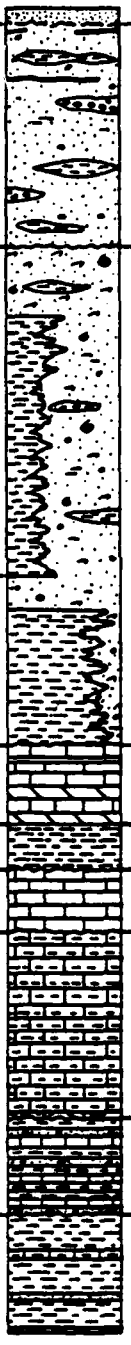


SOURCE: U.S. SOIL CONSERVATION SERVICE, 1969

FIGURE C.6

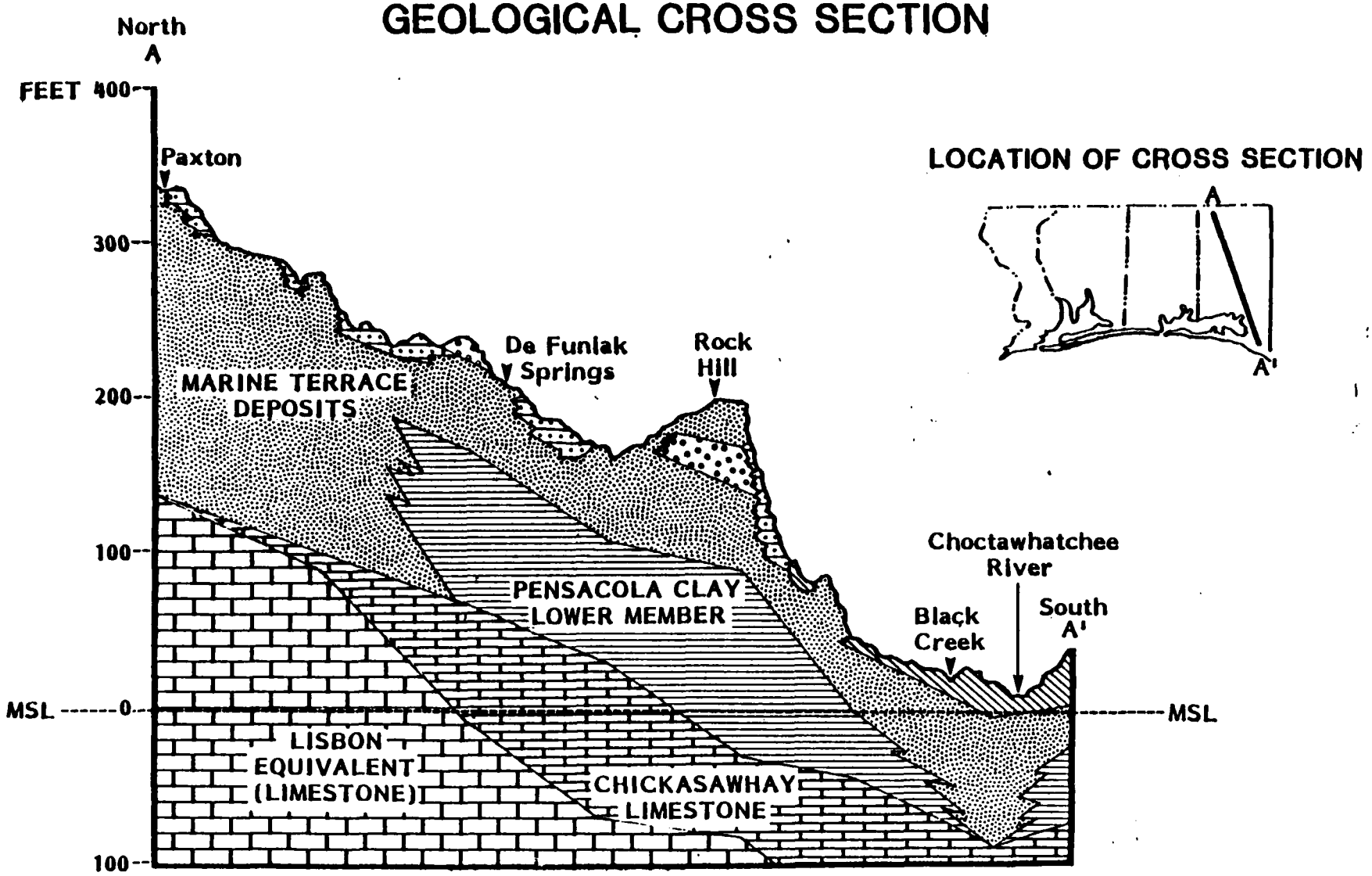
FORMATIONS IN THE WESTERN FLORIDA PANHANDLE

GENERALIZED GEOLOGIC COLUMN

SERIES	GRAPHIC SECTION	FORMATION
PLEISTOCENE		MARINE TERRACE DEPOSITS: Sand, light tan, fine to coarse
PLEISTOCENE (?)		CITRONELLE FORMATION: Sand with lenses of clay and gravel. Sand, light-yellowish-brown to reddish-brown, very fine to very coarse and poorly sorted. Hardpan layers in upper part. Logs and carbonaceous zones present in places. Fossils extremely scarce except near the coast where shell beds may be the marine equivalent of the fluvial facies of the Citronelle.
UPPER MIOCENE		MIOCENE COARSE CLASTICS: Fossiliferous sand with lenses of clay and gravel. Sand is light-gray to light-brown, very fine to very coarse and poorly sorted. Fossils abundant, mostly minute mollusks. Contains a few zones of carbonaceous material. Lower part of coarse clastics present only in northern part of area, interfingering with Pensacola Clay in the central part.
UPPER MIDDLE TO LOWER UPPER MIOCENE		PENSACOLA CLAY: Formation consists of an Upper Member and Lower Member of dark-to-light-gray, tough, sandy clay; separated by the Escambia Sand Member of gray, fine to coarse, quartz sand. Contains carbonized plant fragments, and abundant mollusks and foraminifers. Pensacola Clay is present only in southern half of area, interfingering with the Miocene coarse clastics in the central part.
LOWER MIOCENE AND UPPER OLIGOCENE		CHICKASAWHAY LIMESTONE AND TAMPA FORMATION UNDIFFERENTIATED Tampa: Limestone, light-gray to grayish-white, hard, with several beds of clay; Chickasawhay: Dolomitic limestone, gray, vesicular.
MIDDLE OLIGOCENE		BUCATUNNA CLAY MEMBER OF BYRAM FORMATION: Clay, dark-gray soft, silty to sandy, foraminiferal, carbonaceous.
UPPER EOCENE		OCALA GROUP: Limestone, light-gray to chalky-white foraminifers extremely abundant, esp. Lepidocyclina; corals, echinoids, molluska, bryozoans.
MIDDLE EOCENE		LISBON EQUIVALENT: Shaly limestone, dark-gray to grayish-cream; hard, compact; glauconitic; with thick intervals of dense, light-gray shale.
		TALLAHATTA FORMATION: Shale and siltstone light-gray, hard, with numerous interbeds of gray limestone and very fine to very coarse, pebbly sand. Foraminifers locally abundant.
LOWER EOCENE		HATCHETIGBEE FORMATION: Clay, gray to dark-gray, micaceous, silty, with beds of glauconitic shale, siltstone, and shaly limestone. Mollusks, foraminifers, corals, echinoids. Bashi Marl Member (about 10 feet thick) at base.

SOURCE: MARSH, 1966

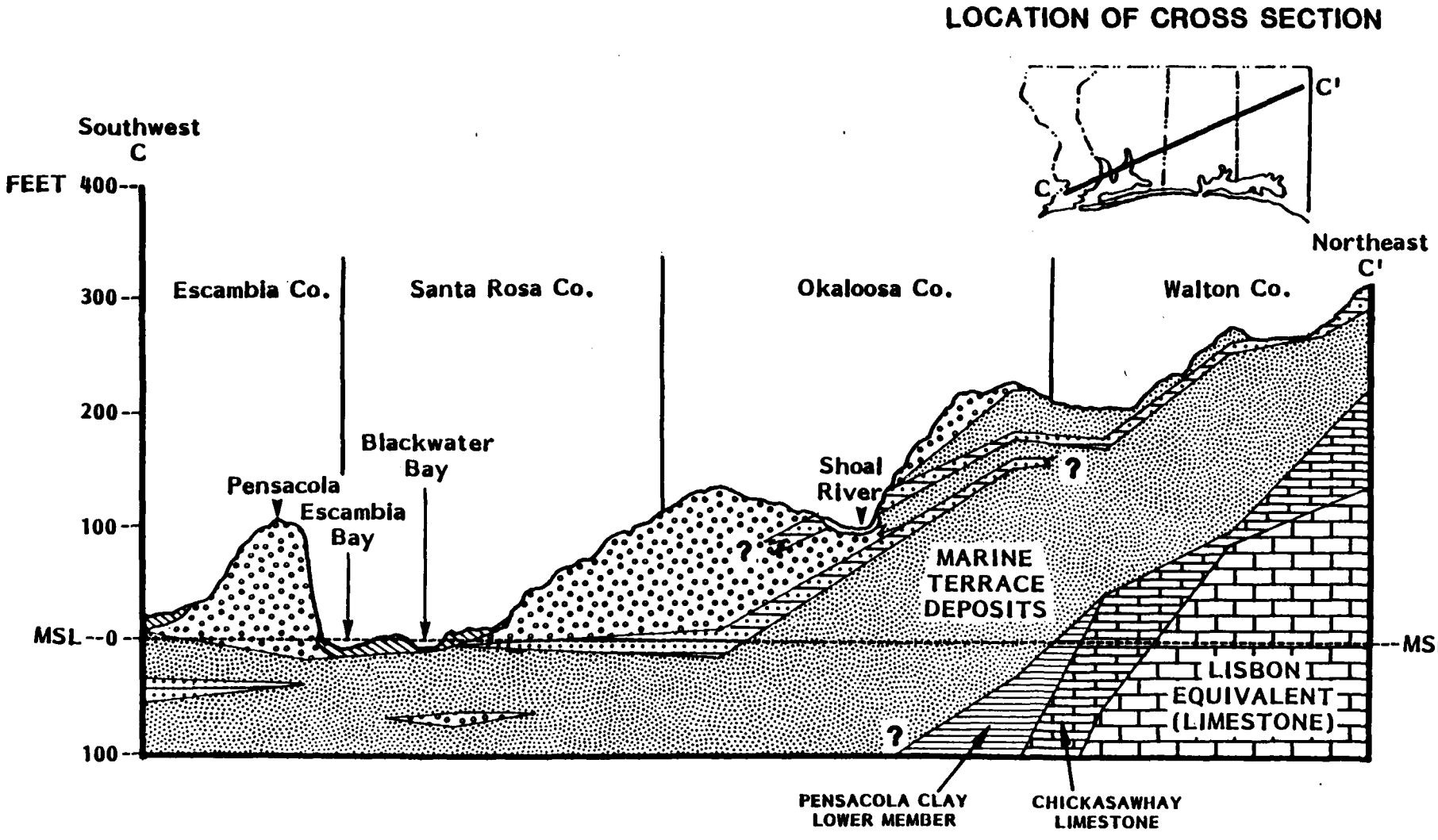
GEOLOGICAL CROSS SECTION



SOURCE: SCHMIDT, 1978

FIGURE C.8

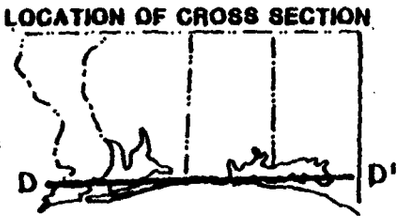
GEOLOGICAL CROSS SECTION

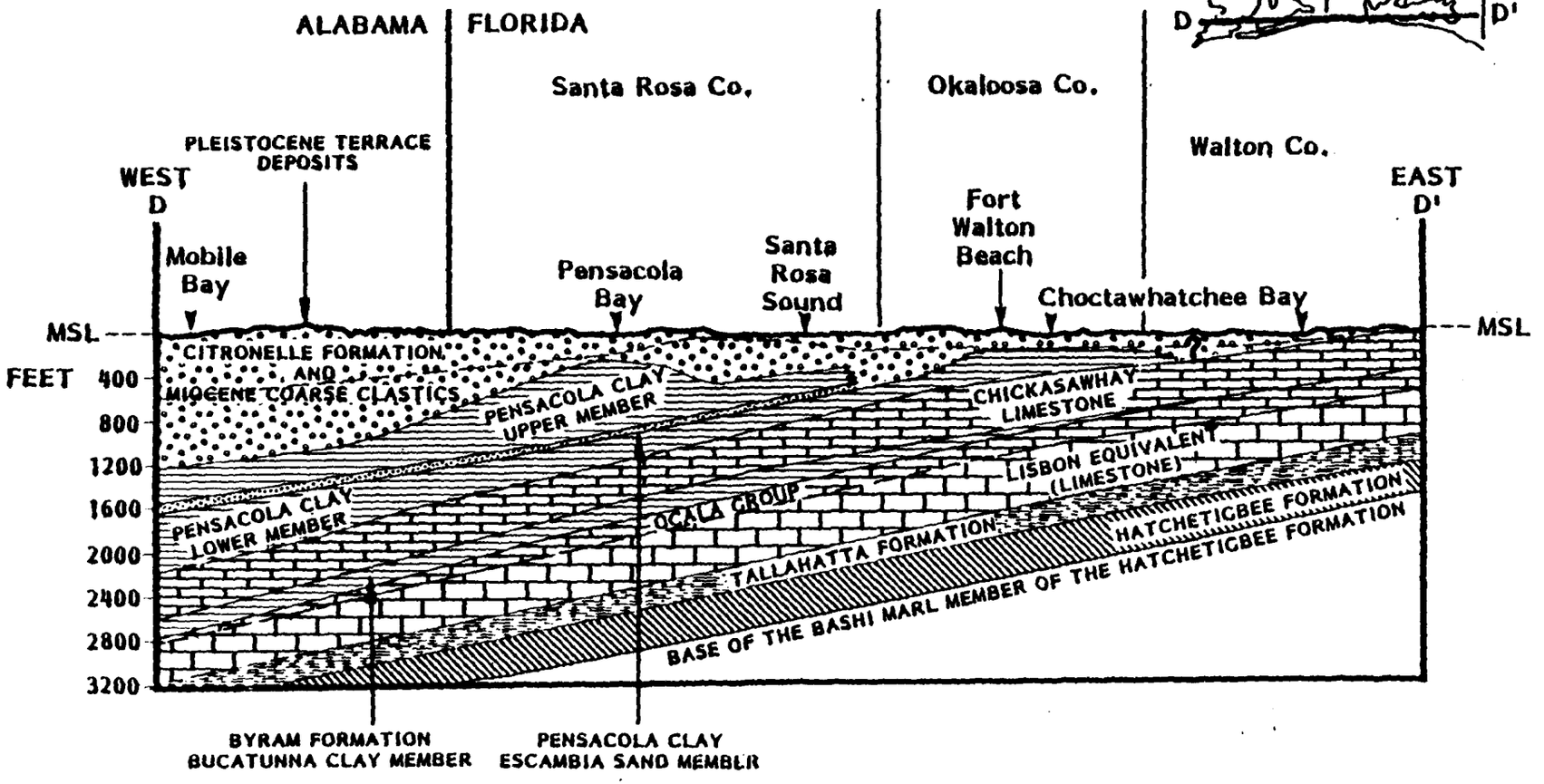


SOURCE: SCHMIDT, 1978

FIGURE C.9

GEOLOGICAL CROSS SECTION





SOURCE: MARSH, 1988

The major geologic formations present in the Eglin Air Force Base Area are, in order of descending chronology:

1) Marine terrace deposits
2) Citronelle Formation
3) Miocene coarse clastics
4) Pensacola Clay
5) Chickasawhay Limestone and Tampa formation
6) Bucatunna Clay (member of the Byram Formation)
7) Ocala Group
8) Lisbon Equivalent
9) Tallahatta Formation
10) Hatchetigbee Formation

A generalized geologic column of the West Florida panhandle adapted from Marsh (1966) is presented as Figure C.7 and graphically presents the relationships of the above units, together with a summary of significant lithologic characteristics. Cross section D-D', presented as Figure C.10, depicts these major geologic units in idealized stratigraphic orientation. Significant geologic units present at shallow depths are presented as cross sections A-A' (Figure C.8) and C-C' (Figure C.9). These figures depict the presence of the Pensacola Clay, a major confining unit, beneath Eglin Air Force Base. Near surface layers of clay or clayey material are also depicted on these cross sections. The upper clay layers shown probably correspond to surficial clay exposures, plotted as "clayey soil pits" on the Surface Soils Map, Figure C.5.

The data presented herein is primarily based upon drilling and direct examination of core samples by Marsh (1966) and others. Recent work now in progress by the Northwest Florida Water Management District included geophysical well logging of selected water wells at Eglin AFB. This information tends to confirm data furnished through earlier studies. The reader is cautioned that these logs represent data supporting work still in progress and may be subject to revision before the final report is to be released, later this year.

HYDROLOGY

Ground Water

Ground-water resources of the project area have been investigated by Trapp et al (1977), Musgrove et al (1965) and Pascale (1974), whose studies form the basis of this summary. The hydrologic regime of the Eglin Air Force Base area is somewhat similar to that of other areas in northwest Florida. The water charging the ground-water system originates within the study area as precipitation, however, most falls outside the study area and moves into it in the form of streams and underground flow. Surficial materials in northwest Florida are highly permeable unconsolidated sands, which facilitates the infiltration of most of the rainfall and provides for its subsequent storage in this zone. Water is lost from the system by stream flow, evapotranspiration, subsurface flow to the Gulf and adjacent areas, and by consumptive use. In a reasonably balanced system, recharge will replace what is lost or consumed. In an area where recharge is exceeded by consumption, steep declines (drawdowns) in the ground-water levels will be noted in areas of concentrated withdrawal. Shallow wells may run dry. Eventually, water quantity and quality will deteriorate, as sea water flows into the system to replace what is lost and not replaced by natural recharge. In the study area, declines have been observed in the water levels of some hydrogeologic units, however, no predictions have yet been published forecasting the loss of any particular units as a source of potable water. One method of preventing this problem has been discussed by Seaber (1981). In order to control excessive drawdowns noted at Fort Walton Beach, Valparaiso and Niceville, it has been suggested that rather than use the present municipal water systems that pump from concentrated areas within a single aquifer, well systems should be distributed over a large land surface area. This concept would mitigate the effects of concentrated pumpage, allowing the very prolific aquifer system of the study area to absorb usage impacts. Another alternative is to employ available surface water from areas north of the installation.

Hydrogeologic Units

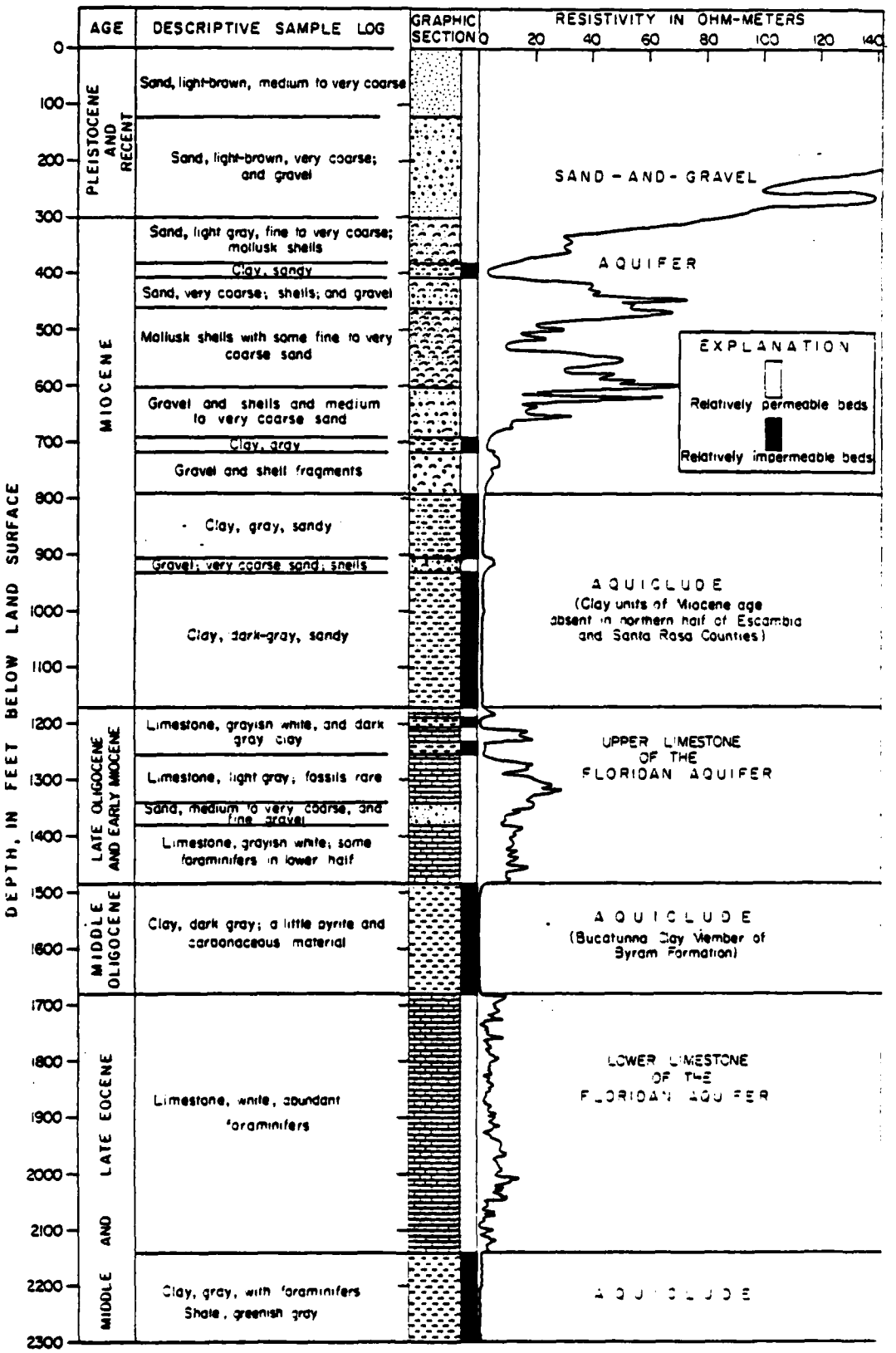
Previous investigations (by Trapp et al, 1977), Musgrove, et al (1965) and Pascale (1974), etc. have identified two major aquifers (Refer to Figure C.11, Hydrogeologic Units, Typical Column) underlying the region. A brief summary of each follows:

1) The Sand and Gravel Aquifer - This hydrogeologic unit is comprised of Pleistocene marine terrace deposits, Pliocene Citronelle Formation and Miocene coarse clastic materials. The lithology of this unit varies from fine sand to coarse quartz sand and gravel interbedded with marine shells and shell fragments. Interbedded clay zones are present. Thickness varies at its eastern limits from a few feet at the Choctawhatchee River to over 1200 feet beneath Mobile Bay. The unit dips southwestward, which is very pronounced in the idealized section presented as Figure C.12. The unit exists generally at water-table (atmospheric) conditions and is recharged primarily by precipitation on its exposed upper surface. Some recharge may be derived from streamflow from other areas. This unit is utilized primarily for domestic and agricultural water sources in Walton and Okaloosa Counties. In Walton County, wells finished in the sand and gravel aquifer vary from 25 to 165 feet in depth, yielding 5 to 30 gallons per minute. This unit is significant due to its capacity to store water (estimated at 20 million acre feet in in Walton County), maintain streamflow and to provide water to shallow wells. In addition, this unit provides recharge to the underlying Upper Floridan, where the two are in hydraulic communication northeast of the Eglin Air Force Base boundary. Okaloosa County wells tapping this unit may extend to a depth of 400 feet. As in Walton County, wells finished into this unit by Okaloosa County consumers employ water from this source primarily for domestic or agricultural use. The City of Fort Walton Beach was reported to have drawn 10 million gallons from this unit prior to 1978 and 33 million gallons in 1978 (Wagner, 1980). Wagner also reported that Eglin Air Force Base derives 5 percent of its total ground-water supplies from this unit, which is employed primarily for irrigation of range areas. In Santa Rosa County, where the unit thickens to an average of 400 feet, numerous individual homes ahd farms utilize it as a source of potable or irrigation water. Permeability and porosity of the unit vary substantially over short

HYDROGEOLOGIC UNITS

TYPICAL COLUMN

PENSACOLA, FLORIDA

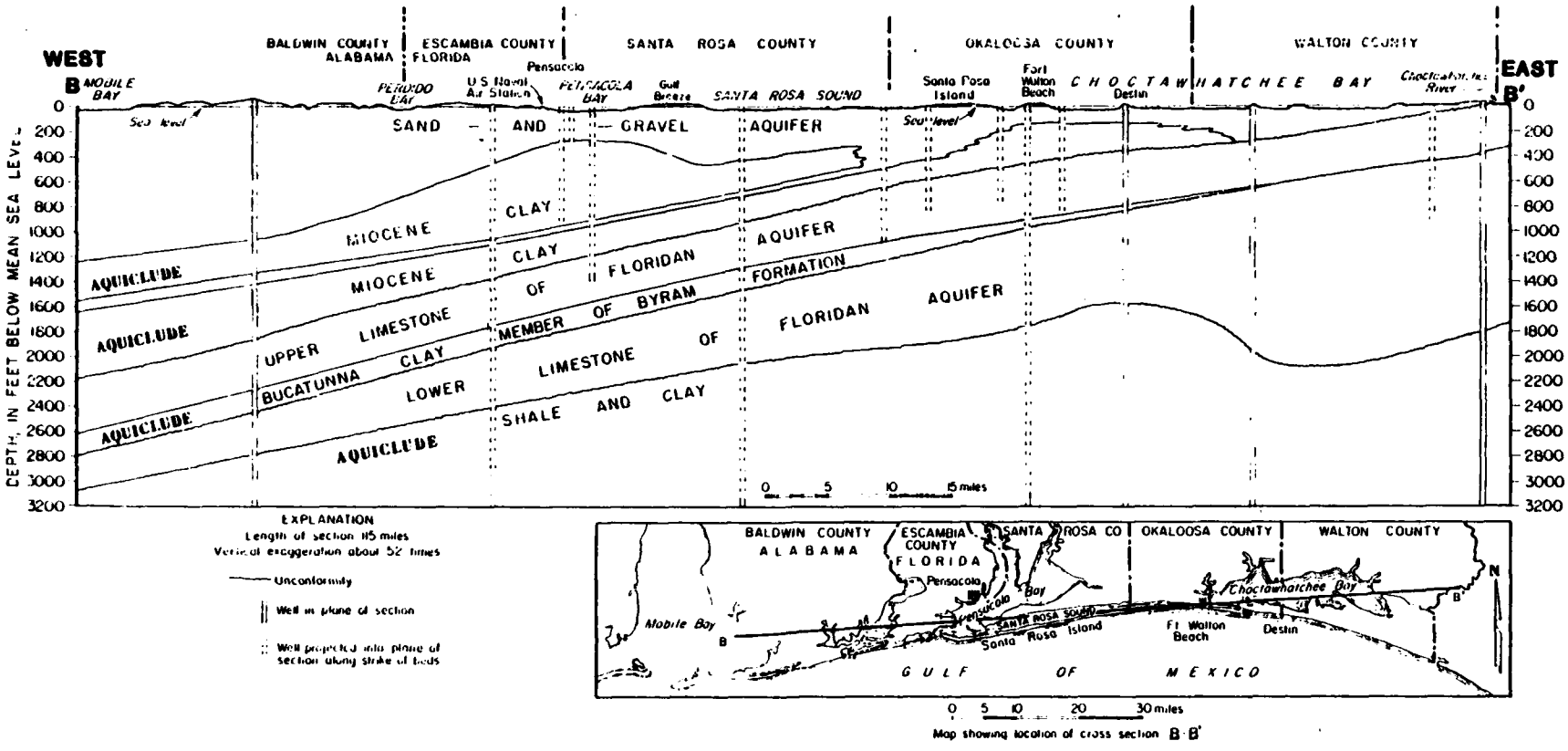


NOTE: The column depicted is typical for western Florida. The same hydrogeologic unit relationships exist, but at shallower depths, below Eglin Main.

SOURCE: MUSGROVE et al, 1965

HYDROGEOLOGIC UNITS

GENERALIZED SECTION



Map showing location of cross section B-B'

SOURCE: MUSGROVE et al, 1965

FIGURE C.12

distances due to local changes in lithology. Discharge of this unit occurs to local springs, streams and to the Gulf.

Immediately below the sand and gravel aquifer is a confining unit, identified by most authors as the Pensacola Clay, shown on Figures C.8, C.9 and C.10. The Pensacola consists of a very dense clay, beginning in Walton County and thickening substantially to some 300 feet to the southwest in Santa Rosa County. The Pensacola dips southwestward, as do other hydrogeologic units of the study area. This unit is reported to have a vertical conductivity of 4.9×10^{-7} feet per day (Trapp, 1977, page 42) indicative of a relatively impermeable material. Where present, the Pensacola probably functions as a reasonably effective confining unit, precluding hydraulic communication between the overlying sand and gravel aquifer and the underlying Floridan. Where the Pensacola is absent, as in eastern Walton County, hydraulic communication between the two aquifers probably exists (Refer to Figure C.13). The actual effectiveness of a confining unit, however, will vary with changes in thickness and lithology.

2) The Floridan Aquifer (Upper Section) - This is the primary hydrogeologic unit of the northwest Florida area, furnishing potable water to most municipal, federal and domestic systems in Walton and Okaloosa Counties. The Floridan underlies most of the State of Florida, as well as parts of Alabama and Georgia. The Floridan averages 1000 feet in thickness and is composed of Eocene to Miocene carbonate rocks (principally limestone and dolomite) with small occurences of clay, marl and sand. The upper surface of the aquifer is reported to dip southwest at an average rate of 34 feet per mile, as shown by Figure C.14. The unit exists at confined (artesian) conditions. As late as 1942, wells located in northern Santa Rosa County tapped the Floridan flowed under artesian pressure. One such well, located at Milton , flowed with a rate averaging 50 gallons per minute. In eastern Walton County, the undivided Floridan aquifer is utilized as a source of potable water. In Okaloosa, Santa Rosa and Escambia Counties, Florida, the Lower Floridan is saline, contains objectionable levels of dissolved solids, and is therefore, not utilized as a drinking water source. In Escambia and Western Santa Rosa Counties, industrial wastes are permitted for discharge to the Lower Floridan (Class V B Water) via injection disposal wells (Trapp, 1977, p. 62).

AREAS OF NATURAL RECHARGE TO THE FLORIDAN AQUIFER

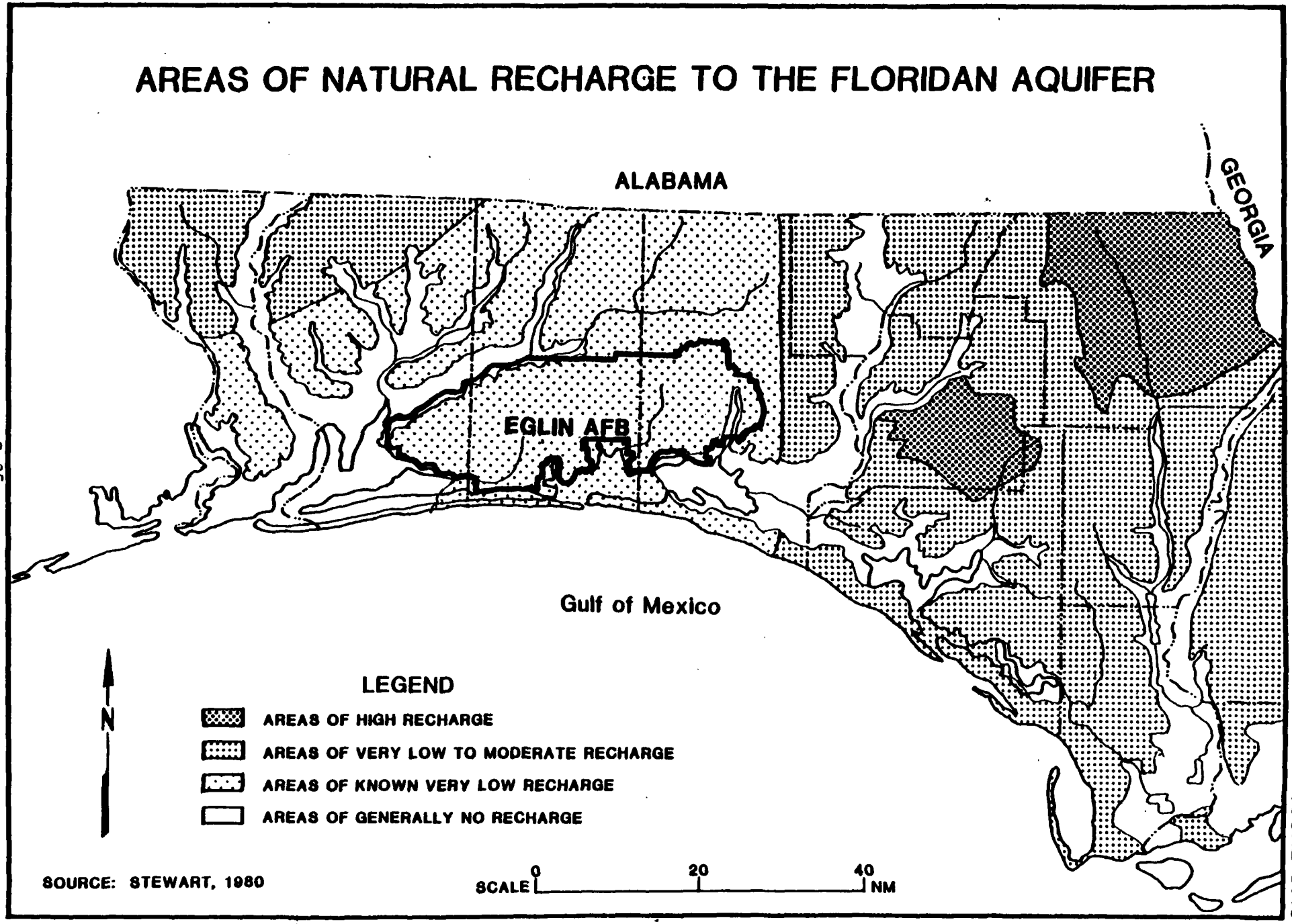
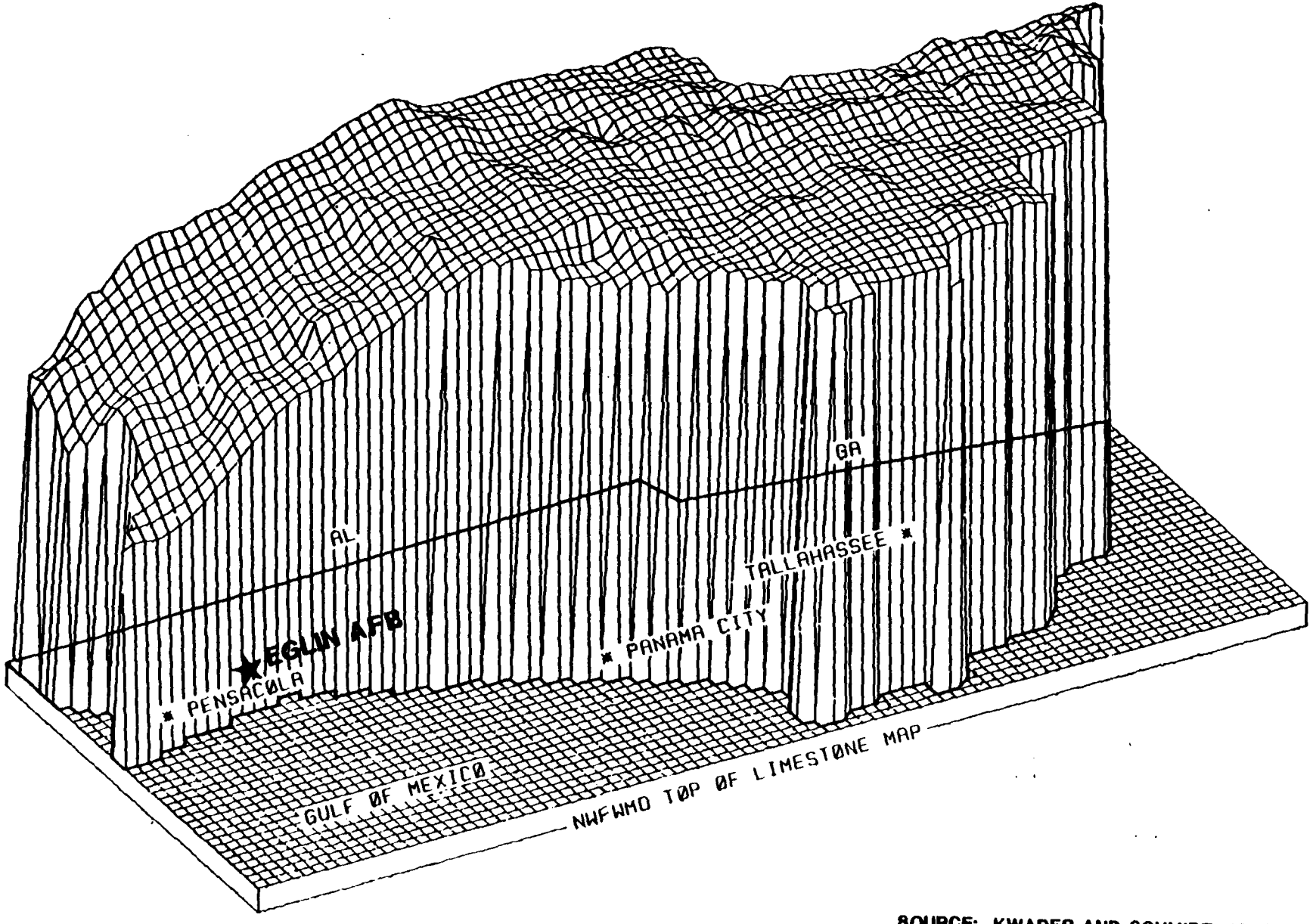


FIGURE C.13

SURFACE TOPOGRAPHY OF THE UPPER FLORIDAN AQUIFER



SOURCE: KWADER AND SCHMIDT, 1978

FIGURE C.14

Recharge of the Floridan occurs at two general locations: 1) where the unit crops out in Conecuh, Escambia and Monroe Counties, Alabama, and 2) where the Pensacola Clay is absent in eastern Walton and Washington Counties, Florida. No recharge to this major aquifer is known to occur within or adjacent to the limits of Eglin Air Force Base. The transmissivity of the Upper Floridan varies in Okaloosa County from a reported 300 square feet per day on Santa Rosa Island to 27,000 square feet per day in south-central Okaloosa County. The specific capacity of this unit is also reported to vary widely due to variations in unit thickness and lithology. Water levels observed in the Floridan have shown large declines approaching 95 feet (Trapp, 1977, p. 53) near concentrated pumping centers such as those at Valparaiso, Fort Walton Beach, Mary Esther and Destin. The decline in observed water levels diminishes with distance from pumping zones. Discharge of this unit occurs down-gradient to the southwest, terminating at the Gulf (Figure C.15).

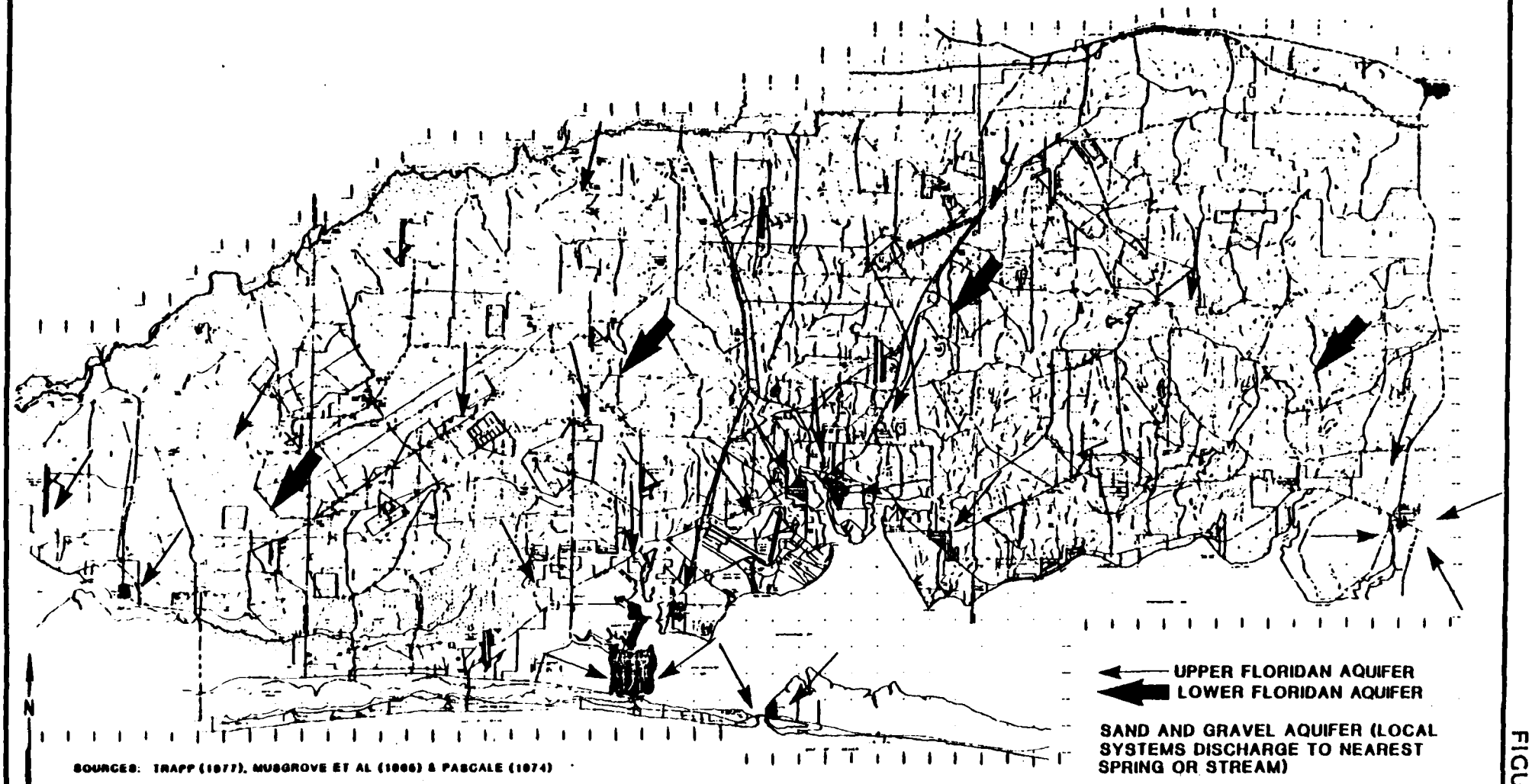
In most of the study area (Western Walton County westward through Santa Rosa County) the Floridan Aquifer is subdivided by an aquiclude into Upper and Lower sections by the presence of a member of the Middle Oligocene Byram Formation, identified locally as the Bucutunna Clay. the Bucutunna Clay begins in Western Walton County, dipping south-westward (as do all other hydrogeologic units), averaging 100 feet in thickness at Pensacola. The unit is known to exist beneath most of the surface area of Eglin AFB. The Bucutunna is, like the Pensacola, a very dense clay. Vertical hydraulic conductivities of this unit are reported to vary from 2.9×10^{-6} to 2.6×10^{-7} feet per day (Trapp, 1977, p. 46).

The Lower Floridan consists of fossiliferrous, chalky limestone and some crystalline calcium carbonate. Lenses of shale, siltstone and clay may be present. The Lower Floridan is confined from above by the Bucutunna Clay where it is present, and along its entire lower margin by the Tallahatta Formation, and therefore, functions under confined (artesian) conditions. The Lower Floridan is recharged in eastern Walton County and Washington County, Florida where it is not subdivided from the overlying Upper Floridan or where the intervening Bucutunna Clay is permeable, thin or breached.

Discharge of the Lower Floridan is to the Gulf area (Figure C.15).

EGLIN AFB

GROUND-WATER FLOW DIRECTIONS



SOURCES: TRAPP (1977), MUSGROVE ET AL (1966) & PASCALE (1974)

FIGURE C.15

EB ENGINEERING - SCIENCE

Ground-water flow directions within the Lower Floridan probably are a mirror image of Upper Floridan pre-pumping flow characteristics.

BIOLOGICAL RESOURCES BASELINE ENVIRONMENT

The biological resources characteristic of Eglin AFB have been identified and studied in previous environmental studies, particularly environmental impact assessments. Four documents contain the majority of the information needed to answer any concerns in these areas. These documents are as follows:

- Environmental Impact Assessment, Data Base for Eglin AFB, FL, Volume II, September, 1976. Prepared by ADTC, Eglin AFB, FL.
- Tab A-1 (Environmental Narrative), October, 1979. Prepared by DEEVM, Eglin AFB, FL.
- Natural Resources Conservation Report, Eglin Air Force Base, FL, 1977 through 1979. 1979, prepared by DEEV, Eglin AFB, FL
- Bold Eagle 82, Environmental Assessment for Eglin AFB, Florida, (draft), April 1981, prepared by Headquarters TAC/DEEV and AD/DEEVE, Eglin AFB, FL.

The natural resources identified on the Eglin AFB support diverse environmental systems. Of the 464,218 acres included in the base, 98 percent, or 455,542 acres are unimproved. A total of 400,233 acres is forested. Wildlife habitat is the major use of 421,796 acres or 91 percent of the base. Unique natural areas occupy 21,250 acres, where as, the actual test ranges only occupy 33,746 acres. Natural lakes cover 153 acres and 29 man-made ponds provide 263 more acres of aquatic habitat. Wetlands exist on over five percent of the base or 26,700 acres. There are approximately 817 miles of streams and 62 miles of tidal coastline within the Eglin AFB. This wide range of native habitats, supplemented with some resource management, has maintained a diverse flora and fauna associated with the site.

Flora

The prevailing type of vegetation on Eglin AFB is open forests of long-leaf pine. On the driest uplands or where the sand is deepest, there is a considerable mixture of small scrub oaks and a few other deciduous trees with small or thick leaves. The wet slopes of the broader branch-valleys have a characteristic bog or wet pine-barren

flora, more richly developed in this region than anywhere else in Florida. There are all gradations between dry and wet pine land. At the heads of some of the streams are dense titi bays. Swamps are common, and vary in character with the size of the stream traversing them and the distance from the coast. Shallow ponds with cypress, slash pine or black gum occur in the flatter places.

Fauna

Eglin is the home of a wide diversity of wildlife. Fifty-two species of fish, 335 species of birds, and 115 species of reptiles and amphibians have been identified on Eglin. Principal game species are white-tailed deer, wild hog, squirrel, rabbit, bobwhite quail and mourning dove. Red and grey foxes and bobcat are the common predatory mammals, and the population of black bear is increasing gradually each year. Raccoon, opossum, armadillo, and pocket gopher are among the more common smaller mammals.

Endangered and Threatened Species

The Endangered Species Act of 1973 (Public Law 93-205; 87 Stat. 884) became effective on December 28, 1973. The animals covered by this Act which may be found on Eglin are the Okaloosa darter, red-cockaded woodpecker, American alligator, southern bald eagle, peregrine falcon, indigo snake, brown pelican, and the pinebarrens tree frog. The habitats of the Okaloosa darter, red-cockaded woodpecker, and American alligator are well established for the Eglin Reservation and the effects of actions upon their habitats can be fairly well assessed. The status of the remainder of the species on Eglin is more difficult to determine thus increasing the complexity of assessing actions based on their habitat requirements.

Potential for Ecological Impact From Migration of Contamination

Information provided by the earlier studies, unpublished data and interviews with base personnel indicates no known circumstances which would result in disruption of the area's ecological characteristics. Several small unrelated fish kills and bird kills have occurred over the history of the base. These were of negligible impact to the natural resources of the base. The causes were natural (eutrophication or botulism) and accidental (birds ingesting pest management poison). During this study no kills or problems were connected with disposal practices.

Some of the identified past disposal practice problem areas have the potential to disrupt the ecosystems present at the base, should a containment failure occur. However, no documented disruptions due to waste disposal practices have occurred.

APPENDIX D

MASTER LISTS OF INDUSTRIAL SHOPS, LABORATORIES AND WASTE STORAGE, TREATMENT AND DISPOSAL SITES

TABLE D.1
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
AD					
Card Punch Section	380	None Recorded(3)			
Freeman Computer Lab	380	None Recorded			
Life Support Section	32	None Recorded			
Systems Design Section	100	None Recorded			
AFATL					
Aero Ballistics	415	None Recorded			
Ballistics Experiment	419	None Recorded			
Biology Lab	13	None Recorded	X	X	Sanitary Sewer
Chemistry Lab	13	None Recorded	X	X	Sanitary Sewer
Dynamics Lab	991	None Recorded			
Environmental Research	574	None Recorded	X	X	Sanitary Sewer
Explosive Processing	1206	None Recorded			
Fuse Lab	13	None Recorded			
Graphics	(merged)	to '78			
Gun Rocket Lab	382	None Recorded			
Air to Air Missile	13A	None Recorded			
Interior Ballistics	410	None Recorded			

(1) Hazardous waste according to RCRA or a potentially hazardous waste (one which was suspected of being RCRA hazardous although insufficient data was available to fully characterize the waste).
(2) Past treatment, storage, and/or disposal activities - Present activities are covered under RCRA.
(3) None recorded indicates that available records or documentation indicated no past building locations existed.

TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
AD (Continued)					
Laser Lab	13	None Recorded(3)			
Model Shop/Fiberglass	614 '79-Pres	13 to '79	X	X	Refuse trash
Model Shop/Sheet Metal	614 '79-Pres	13 to '79	X		
Model Shop/Welding	614 '79-Pres	13 to '79	X		
Propellant Evaluation					
Properties Lab					
Ballistics Branch	415 '79-Pres	410 to '79	X	X	DPDO
USAF HOSPITAL					
Dental Clinic	2825	277 '60's			
Medical Lab	2825	277 '60's			
Pathology Services	2825	277 '60's			
Medical Maintenance	2825	277 '60's			
Surgery	2825	277 '60's			
CE Section	2825	277 '60's			
33 AGS					
Det.1, 5th CCG	Discontinued	Site A-21 to '80			
Aircraft Maint. Sect.	Hangar 17-Pres	None Recorded	X	X	DPDO
780 Sect./Support Br.	Discontinued	TAC Hangar 18 to '79			
Weapons Flight Sect.	1345 '79-Pres	to '79			

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(3) None recorded indicates that available records or documentation indicated no past building locations existed.

TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
33 CRS					
Avonics AGE Shop	1358 '79-Pres	1355 '78-79 1328 to '78			
Communications Sect.	1318 '78-Pres	1328 to '78			
Engine Test Cell	Discontinued	1361 to '80	X	X	Not Recorded
Electronic Counter Measures	Discontinued	1355 '77-'79			
Propulsion Branch	1352,1374 '80-Pres	1352 '77-'80 1361 '73-'77 1352 to '73	X	X	DPDO
Environmental Systems	1354 '77-Pres	to '77			
Inertial Navigation Shop	1358 '79-Pres	1328 to '79	X		
Instrument & Auto Pilot	Discontinued	1318 '77-'79 1328 to '77			
Machine Shop	1352 '77-Pres	129 to '77	X	X	DPDO
Paint Shop	Discontinued	Hangar 4 (No past records are available. Assumed combined with 33 EMS Corrosion Control)			
Pave Spike Shop	Discontinued	73 '77-'79 1345 to '77			
Photo Camera Shop	Discontinued	1358 '77-'79 1328 '74-'77 1355 to '74	X		
Pneudraulics Shop	1354 '77-Pres	1352 to '77	X	X	DPDO
Quality Control	1355 '77-Pres	None Recorded(3)			

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(3) None recorded indicates that available records or documentation indicated no past building locations existed.

TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
33 CRS (Continued)					
Sheet Metal Shop	Discontinued	1352 to '79	(Consolidated with 33 CRS Structural Repair)		
Structural Repair	1352 '78-Pres	1343 '74-'78 129 to '74			
Survival Equip/ Parachute	32 '78-Pres	1352 '76-'78 1326 '74-'76 1321 to '74			
Weapons Control Systems	Discontinued	1358 '78-'79 1343 '77-'78 1328 to '77			
Welding Shop	(Name change only to Metal Processing)				
Metal Processing	1352 '75-Pres	127-'75			
780 Section	(Name change only to Electric Shop)				
Electric Shop	1352	None Recorded(3)			
33 EMS					
Aerospace Ground Equip AGE Shop	1353 '79-Pres	1372 '77-'79 1353 to '77	X	X	DPDO
Repair & Reclamation	1372 '79-Pres	1343 to '79	X	X	DPDO
Armament Systems	1360 '78-Pres	1326 '74-'78 1344 to '74	X	X	DPDO
Corrosion Control	1353 '78-Pres	1313 '73-'78 1330 to '73	X	X	DPDO
Egress	1351	None Recorded			

(1) Hazardous waste according to RCRA or a potentially hazardous waste (one which was suspected of being RCRA hazardous although insufficient data was available to fully characterize the waste).
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(3) None recorded indicates that available records or documentation indicated no past building locations existed.

TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
33 EMS (Continued					
Electric/Battery shop	1354 '76-Pres	1352 to '76	X	X	Fire Training
Environmental System	(Discontinued and combined with 33 CRS Environmental System)				
Equipment Maintenance	(Name change only to Non-powered AGE shop)				
Non-Powered AGE Shop	1208 '78-Pres	1381 to '78			
Fuels Systems	1339	None Recorded(3)			
Jet Engine Test Cell	Discontinued	1361 to '78	(Included with 33 CRS Propulsion Br.)		
Missile Maintenance	1285	None Recorded	X	X	DPDO, Sand Pit
Mobility Section	Discontinued	1352 to '77			
Phase Inspection	1318	None Recorded			
Powered AGE Shop	Discontinued	1372 (Combined with 33 EMS AGE shop)			
Tire Shop	Discontinued	1318 (Combined with 33 EMS Non-powered AGE Shop, then 33 EMS Repair and Reclamation shop)			
55 ARRS					
AGE Shop	428 '76-Pres	421 to '76	X	X	DPDO
Auto Pilot Shop	421	None Recorded			
Corrosion Control	421	None Recorded	X	X	DPDO
Electronics shop	Discontinued	421 to '81 (Combined with 55 ARRS Electronic Counter Measures)			
Electronic Counter	421	None Recorded			
Engine Shop	421	None Recorded			
Environmental System	421	None Recorded			

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(2) Past treatment, storage, and/or disposal activities - Present activities are covered under RCRA.
(3) None recorded indicates that available records or documentation indicated no past building locations existed.

TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
55 ARRS (Continued)					
Flightline Maintenance (C-130)	421	None Recorded(3)			
Flightline Maintenance (H-53)	Discontinued	421 to '81 (Combined with 55 ARS Flightline Maintenance C-130)			
Gun Shop	123	None Recorded	X	X	DPDO
Instrument Shop	421	None Recorded			
Navigational Aids	421	None Recorded			
Pararescue	421	None Recorded			
Pneudraulics	421	None Recorded	X	X	DPDO
Propeller Shop	421	None Recorded	X	X	DPDO
Doppler Shop	421	None Recorded			
Radio Shop	421	None Recorded			
Sheet Metal Shop	421	None Recorded			
Survival Equip. Shop	Discontinued	421 (Moved to 728 TCS Vehicle Maintenance)			
21 Shop	Discontinued	421 (No records available; activities unknown)			
728 TCS (Duke Field)					
AGE Shop	3057	None Recorded	X	X	DPDO
Air Traffic Reg. Ctr.	Discontinued	3064 to '79			
AN/TSQ 91	728 TCS/TSQ-91	None Recorded			
Computer Maintenance	3057	None Recorded			

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(2) Past treatment, storage, and/or disposal activities - Present activities are covered under RCRA.
(3) None recorded indicates that available records or documentation indicated no past building locations existed.

TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
728 TCS (Duke Field) (Continued)					
Crypto Maintenance	3057	None Recorded(3)	X	X	DPDO
Ground Radio Maintenance	3057	None Recorded			
Refrigerator Sect.	3057	None Recorded			
Radar Maintenance	3057	None Recorded			
TC-30 Sect.	3057	None Recorded			
Technical Control	3057	None Recorded			
UHF Section	No Records Available				
Vehicle Maintenance	3072	None Recorded			
Warehouse	3032	None Recorded			
Wire Maintenance	3057	None Recorded			
919 CAMRON (Duke Field)					
Aero Repair	3020 '77-Pres	3076 to '77	X	X	DPDO
AGE Shop	3067	None Recorded	X	X	DPDO
Avonics Sensors	3075	None Recorded			
Communication Shop	3076	None Recorded			
Corrosion Control	3067	None Recorded	X	X	Oil/Water (o/w) separator then sanitary sewer
Electric Shop	3075	None Recorded			

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(2) Past treatment, storage, and/or disposal activities - Present activities are covered under RCRA.
(3) None recorded indicates that available records or documentation indicated no past building locations existed.

MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
919 CAMRON (Continued)					
Electronic Warfare System	3025	None Recorded(3)			
Engine shop	3076 '75-Pres	3025 to '75	X	X	DPDO
Environmental Systems	3076	None Recorded			
Fire Control Section	3025	None Recorded			
Flightline Maintenance	3025	None Recorded	X	X	Oil/Water separation, the.. sanitary sewer, DPDO
Fuel System Repair	3001	None Recorded	X	X	Fire Training
Gun Service	3023	None Recorded	X	X	DPDO
Hydraulic Shop	3076	None Recorded	X	X	DPDO
Inertial Navigation	3076	None Recorded	X	X	TAW to 00-110-N-2
Instrument & Auto Pilot	3076	None Recorded			
Navigational Aids	3076	None Recorded			
Non Destructive Inspection	3025	None Recorded	X	X	Sanitary Sewer DPDO
Phase Inspection Docks	3029	None Recorded	X	X	Oil/Water Separation, th« sanitary sewer, DPDO
Propeller Maint.	3076	None Recorded			
Sheet Metal Shop	3076	None Recorded	X		

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(3) None recorded indicates that available records or documentation indicated no past building locations existed.

TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
919 CAMRON (Continued)					
Survival Equip/Para.	3025	None Recorded(3)			
Welding shop	3076	None Recorded			
1972 COMMUNICATIONS					
Battery Room	(All waste activity combined with 1972 Commu. Maint. Sect)				
CCTV	954	None Recorded			
Crypto Maint.	1	None Recorded			
Ground Radio	954	None Recorded			
Main Radio Shop	954	None Recorded			
Maintenance Section	920	None Recorded			
Navigational Aids	2493	None Recorded			
Radar Shop	104	None Recorded			
3201 ABG/MWR					
Sites C64A & C74A	C64A & C74A	None Recorded			
Museum Wood Shop	877	None Recorded			
3201 ABGP					
Auto Hobby Shop	721	None Recorded			
Ceramics Hobby Shop	722	None Recorded			
Destruct Classified	554	None Recorded			

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(2) Past treatment, storage, and/or disposal activities - Present activities are covered under RCRA.
(3) None recorded indicates that available records or documentation indicated no past building locations existed.

TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
3201 ABGP (Continued)					
Engineering Data	350	None Recorded(3)			
Golf Course Maint.	1530	None Recorded	X	X	DPDO, Ground
Laundry Facility	876	None Recorded			
Micrographics	350	None Recorded	X	X	Sanitary Sewer
Photo Hobby Shop	721	None Recorded			
Printing Plant	1	None Recorded	X	X	Sanitary Sewer
Camera Sect.	1	None Recorded	X	X	Sanitary Sewer
Security Police	272 '76-Pres	278 '75-'76	X	X	Landfill (to '79)
		50 to '75			DPDO ('79-Pres
Wood Hobby Shop	721	None Recorded			
3201 TRANS					
Air Freight Sect.	968	None Recorded			
Body Shop					
Consolidated Maint.	(Conbined with 3201 TRANS Diagnostic Test Center)				
Field 3 Motor Pool	561	None Recorded	X	X	DPDO
Fire Truck Maint.	500	None Recorded	X	X	DPDO
General Purpose Vehicle Maintenance	500	None Recorded	X	X	DPDO
Vehicle Maintenance (Jackson)	693	None Recorded	X	X	DPDO

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(2) Past treatment, storage, and/or disposal activities - Present activities are covered under RCRA.
(3) None recorded indicates that available records or documentation indicated no past building locations existed.

TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
3201 TRANS (Continued)					
Heavy Equipment Maint.	693	None Recorded(3)	X	X	DPDO
Lawnmower Maintenance	662	None Recorded	X	X	DPDO
Lube Rack and Battery Shop	500 '74-Pres	561 to '74			
Diagnostic Test Center	500	None Recorded	X	X	DPDO
Motor Pool (Duke)	3076	None Recorded	X	X	DPDO
Packing & Crating	613	None Recorded			
Paint Shop	561	None Recorded	X	X	DPDO
POL	562	None Recorded	X	X	DPDO
Special Purpose Maint.	500	None Recorded	X	X	DPDO
Tire Shop	561	None Recorded			
3202 CES					
Asphalt Plant	571	None Recorded			
Carpenter Shop	690	None Recorded	X		
Electric Motor Repair	690	None Recorded	X	X	Oil Bowser
Electric Shop	690	None Recorded			
Entomology	692	None Recorded	X		
Exterior Electric	692 '78-Pres	116 to '78			
Fire Extinguisher Maintenance	107	None Recorded			
Grounds Sect.	690	None Recorded	X	X	DPDO

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(2) Past treatment, storage, and/or disposal activities - Present activities are covered under RCRA.

(3) None recorded indicates that available records or documentation indicated no past building locations existed.

TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
3202 CES (Continued)					
Golf Course Maint.	Discontinued	1530 (Combined with 3201 ABGP Golf Course Maint.)			
Heavy Equipment Maintenance	693	None Recorded(3)	X	X	Bowser
Liquid Fuels Maint.	690	None Recorded	X	X	DPDO, Fire Training
Metal Working Shop	690	None Recorded	X		
Paint Shop	690	None Recorded	X	X	DPDO
Pavements Sect.	690	None Recorded			
Plumbing Shop	690	None Recorded			
Range Support Sect.	691	None Recorded	X	X	DPDO
Power Production	690	None Recorded	X	X	DPDO, Sanitary Sewer
Refrig. & Air Cond.	690	None Recorded	X	X	DPDO
Water and Waste Sect.	2820	None Recorded			
Carpenter Shop (Duke)	3036	None Recorded	X	X	DPDO
Heating/AC/Elec.(Duke)	3031	None Recorded	X	X	DPDO
Paint Shop (Duke)	3036	None Recorded	X	X	DPDO
Pavements & Grounds	3036	None Recorded	X	X	DPDO
Plumbing (Duke)	3031	None Recorded			
Sewage Plant (Duke)	3050	None Recorded	X	X	Spray Field

(1) Hazardous waste according to RCRA or a potentially hazardous waste (one which was suspected of being RCRA hazardous although insufficient data was available to fully characterize the waste).
(2) Past treatment, storage, and/or disposal activities - Present activities are covered under RCRA.
(3) None recorded indicates that available records or documentation indicated no past building locations existed.

TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
3027 MMS					
Carpenter Shop	1209	None Recorded(3)			
Conventional Maint.	1209	None Recorded			
Conventional Maint. (Paint)	1218	None Recorded			
Equipment Maint.	1208	None Recorded			
Gun Services	102	None Recorded			
Missile Maint.	1210 '78-Pres	1212 to '78			
Weapons Loading	102 '78-Pres	940 to '78			
Weapons Release	102	None Recorded			
3210 SUPPLY					
Bulk Fuels Stor.	89	None Recorded			
Computer Rm.	600	None Recorded			
Fuels (Duke)	3033	None Recorded			
Fuels Lab	89	None Recorded			
Fuels Lab (TAC area)	1339	None Recorded			
Liquid Oxygen Plant	969	None Recorded	X		
Tube Storage	615	None Recorded			
3211 FMS					
AGE Shop	101	None Recorded	X	X	DPDO
Aircraft Modification	130	None Recorded			

(1) Hazardous waste according to RCRA or a potentially hazardous waste (one which was suspected of being RCRA hazardous although insufficient data was available to fully characterize the waste).
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TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
3211 FMS (Continued)					
Aircraft Repair	130	None Recorded(3)			
Corrosion Control	72 '76-Pres	137 to '76	X	X	
Egress Systems	32 '79-Pres	130 to '79			
Electric Shop	136 '78-Pres	136 to '78	X	X	On ground
Environmental Systems	130	None Recorded	X	X	Evaporation
Fiberglass shops	127	None Recorded	X	X	DPDO, ditch
Fuel Systems Repair	135	None Recorded	X	X	DPDO
Jet Engine Shop	134 '77-Pres	422 to'77	X	X	DPDO
Jet Engine Test Cell	455/456	None Recorded			
Lead Acid Battery Shop	136	(Part of Electric Shop)			
Machine Shop	129	None Recorded			
Nickel-Cadmium Battery	136	(Part of Electric Shop)			
Non Destructive Inspection	411	None Recorded	X	X	
Paint Shop	127 '76-Pres	70 to '76	X	X	DPDO
Survival Equip.	32 '79-Pres	110 '74-'79 39, 40 to '74			
Patterns/Plastics	127	None Recorded			
Pneudraulics	130	None Recorded	X	X	DPDO
Sheet Metal Shop	129	None Recorded			

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TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
3211 FMS (Continued)					
Tow Target Section	426 '76-Pres	70 to '76			
Welding Shop	127	None Recorded(3)	X	X	Sanitary Sewer
3214 OMS					
Flightline Maint.	110	None Recorded			
Ground Support Equip.	110	None Recorded			
21 Section	110 '78-Pres	102 to Pres.			
3242 AMS					
Auto Pilot Shop	100	None Recorded			
Communication Shop	100	None Recorded			
Electronic Counter-measures	100	None Recorded			
Inertial Nav. Systems	100	None Recorded			
Instrument Shop	Discontinued	100 (No records or data available)			
Navigation Aids	100	None Recorded	X	X	DPDO
Measurement Equip.	78	914 to '79	X	X	DPDO
Weapons Control	100	None Recorded			
3246 TEST WING					
Aero Design Sect.	250 '79-Pres	100 to '79			
Armament Systems	961	None Recorded			

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TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
3246 TEST WING (Continued)					
Climatic Lab - Electrical	440	None Recorded(3)	X		
Climatic Lab - Support	440	None Recorded	X	X	DPDO
Climatic Lab	440	None Recorded	X	X	DPDO
Climatic Lab - Fuse Test	432,434,453	None Recorded	X	X	DPDO
Climatic Lab - Inspect	Discontinued	432 (No records or data available)			
Climatic Lab - Data	440	None Recorded			
Climatic Lab - Mechanical	440	None Recorded			
Electronic Design	22	None Recorded	X		
Electro Optical	22	None Recorded	X	X	Sanitary Sewer
Graphics Shop	1	None Recorded			
Life Support	32,60 '79-Pres	255 to '79			
Marine Maint.	792	None Recorded			
Parks Photo - Chem Mix	55	None Recorded	X	X	Sanitary Sewer, Silver Recover
Parks Photo - Maint.	55	None Recorded			
Parks Photo - Processing	55	None Recorded	X	X	Sanitary Sewer, Silver Recover

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TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
3246 TEST WING (Continued)					
Parks Photo - Still	55	None Recorded(3)	X	X	Sanitary Sewer, Silver Recovery
System Design	100	None Recorded	X	X	
4751 ADS (Site A-15)					
Electronics Maint.	12522	None Recorded			
Missile Maintenance	12521	None Recorded	X		
Utilities Section	12530	None Recorded	X	X	DPDO
20 SURVEILL SQN					
Computer Maintenance	8640	None Recorded			
Air Conditioning	8640	None Recorded			
Electric Shop	8640	None Recorded			
Surveillance Sqn.	8635	None Recorded			
Radar Maint.	8633	None Recorded	X	X	Refuse trash (rags)
Power Production	Discontinued	8636	(Combined with 20 Surveil Electric Shop)		
AGOS (Hurlburt Field)					
Carpenter Shop	90004	None Recorded	X	X	Sanitary Sewer

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TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
1 SOW (Hurlburt Field)					
Graphics	90758	None Recorded(3)			
Photo Lab	90759	None Recorded	X	X	Sanitary Sewer, Silver Recovery
823 CES RED HORSE (Hurlburt Field)					
Carpenter Shop	91120	None Recorded			
Entomology Shops	Discontinued	91128 to '75	X		
Heating Shop	91120 '76-Pres	91128 to '76			
Liquid Fuels Shop	91120	None Recorded	X		
Mason Shop	91120	None Recorded			
Metal/Welding Shop	91120	None Recorded	X		
Paint Shop	91125	None Recorded	X	X	POL waste tank
Pavement & Equipment	91107 '78-Pres	90755 '76-'78 91120 ' to '76			
Plumbing Shop	91120	None Recorded	X		
Refrigeration	91120	None Recorded			
Vehicle Maint.	91128, 91124	None Recorded	X	X	POL waste tank
Water & Waste	91120	None Recorded			
834 AGS (Hurlburt Field)					
Spec. Flight Crew	90128	None Recorded			
Weapons Loading	90816 '74-Pres	9160 to '74			
Maintenance Shop	90406 '75-Pres	90815 to '74	X	X	Landfill

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TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
834 AGS (Hurlburt Field) (Continued)					
Storage	90405	None Recorded(3)			
Weapons Release	90731 '74-Pres	9143 to '74	X	X	POL
834 CES (Hurlburt Field)					
Carpenter Shop	90138 '73-Pres	9009 to '73			
Entomology Shop	90024 '74-Pres	9018 to '74			
Exterior Electric	90138	None Recorded	X	X	PCB Storage Facility
Fire Department	90735 '74-Pres	90140 '73-'74 9125 to '73			
Golf Course Maint.	90130	None Recorded	X	X	
Interior Electric	90138	None Recorded	X	X	Oil/Water Separator
Liquid Fuels	90121 '78-Pres	90140 '74-'78	X	X	POL
Paint Shop	90138 '76-Pres	90137 to '76	X	X	Landfill
Grounds Shop	90138 '74-Pres	9009 to '74	X		
Heavy Equip.	90138	None Recorded			
Plumbing Shop	90138 '74-Pres	9009 to '74			
Power Production	90121 '77-Pres	90138 to '77	X	X	Dumpster
Refrigeration Shop	90138	None Recorded			
Sewage Treatment	90021	9050 to '73			
Sheet Metal/Welding	90138	None Recorded			

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TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
834 CRS (Hurlburt Field) (Continued)					
Battery/Elect. Shop	90700 '73-Pres	9120 to '73	X	X	Neutralization Sanitary Sewer
Commo/Nav. Shop	90028	None Recorded(3)			
Doppler Shop	90028	None Recorded			
Electronic Counter-measures	90033 '79-Pres	90028 to '73			
Environmental System	90700 '74-Pres	9120 to '74	X	X	DPDO
Hydraulics Shop	90743 '74-Pres	9120 to '74	X	X	DPDO
Fabric Shop	90743 '74-Pres	9140 to '74			
Inst./Auto-Pilot Shop	90028	None Recorded			
Machine Shop	90700 '73-Pres	9120 to '73	X	X	POL
Non-Destructive Insp.	90150 '73-Pres	9004 to '73	X	X	Oil/Water Separator, Sanitary Sewer
Welding Shop	90700 '74-Pres	9120 to '74			
Propulsion Shops	90131 '74-Pres	9004 to '74	X	X	POL
Mission Systems	90028 '74-Pres	9148 to '74			
Structural Repair	90700 '74-Pres	9120 to '74	X	X	Refuse Dumpster
834 CSG (Hurlburt Field)					
Auto Hobby Shop	90612 '79-Pres	90761 to '79	X	X	POL
Ceramics Hobby Shop	90612 '78-Pres	90204			

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TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
834 CSG (Hurlburt Field) (Continued)					
POL Fuels Lab	90030 '79-Pres	90133 '73-'79X to '73	X	X	Landfill, DPDO
Reproductions	90328	None Recorded(3)			
Small Arms Range	90520 '76-Pres	90329 '74-'76	X	X	DPDO
		9139 to '74			
Storage & Issue	(Discontinued)	90710 to '78	X		
834 EMS (Hurlburt Field)					
AGE Shop	90822 '79-Pres	90817 '74-'79 9162 to '74	X	X	DPDO, POL
Armament Systems	90731 '79-Pres	90817 '74-'79 9143 to '74	X	X	POL
Intermediate Maint.	90700	None Recorded	X	X	POL, Oil/Water Separator
Corrosion Control	90700 '74-Pres	9120,9168 to '74			POL, Oil/Water Separator
Explosive Ord. Disp.	90816	None Recorded	X	X	Landfills
Fuel Syst. Tank Repair	90825 '74-Pres	9169 to '74	X	X	POL
Wheel & Tire Shop	90700 '74-Pres	No. not Recorded to '74	X	X	DPDO
Transcient Alert	90730	None Recorded	X		

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TABLE D.1 (Continued)
MASTER LISTS
INDUSTRIAL SHOPS AND LABORATORIES

Name	Present Location and Dates (Bldg. No)	Past Location and Dates (Bldg. No.)	Handled Hazardous Materials	Generated Hazardous Wastes(1)	Past On-site T.S.D(2)
834 TRANS (Hurlburt Field)					
Allied Trades - Welding	90108 '79-Pres	90102 '74-'79 9060 to '74	X		
Allied Trades - Paint Booth	90110	None Recorded(3)	X	X	Drain to ditch
Fire Truck Maint.	90735	None Recorded	X	X	POL
Fuel Truck Maint.	90023	None Recorded	X		
Gen. Purpose Maint.	90102	None Recorded			
Oper. Maint. (Batteries)	90102 '74-Pres	9160 to '74	X	X	Neutralization, Oil/Water Separator
Vehicle Repairs	90102 '75-Pres	90103 to '75			
2068 COMMO (Hurlburt Field)					
Cable Maint.	90506	None Recorded			
Crypto Maint.	90506 '78-Pres	90348 '74-'78 90215 to '74	X		
Telecom Processing	90226 '79-Pres	90215 to '79			
Navigation Aids	91215 '79-Pres	Trailer to '79			
Outside Maint.	90506 '80-Pres	90135 to '80			
Radar Maint Trailer	90802	None Recorded			
Telephone Central	90215	None Recorded			

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TABLE D.2
MASTER LIST OF PAST WASTE DISPOSAL LOCATIONS

Site No.	Site Description	UTM Coordinates	Hazardous Wastes Suspected Present
EGLIN MAIN AREAS			
D1	Eglin Main Base Landfill (1940's-early 60's)	EJ 549350, 3370600	X
D2	Eglin Main Base Landfill (early 1960's - 1972-1973)	EJ 545400, 3369900	X
D3	Eglin Main Base Landfill (1972-73 - 1978)	EJ 548000, 3370700	X
D4	Disposal Pit Near Skeet Range	EJ 549450, 3370800	X
D5	A-19 Drum Disposal Site	EJ 547510, 3373420	X
D6	End of Runway 01 Hardfill Site	EJ 546950, 3374290	
D7	Receiver Area Disposal Site	EJ 547320, 3373830	X
EGLIN RESERVATION			
D8	CB Lab Landfill	EJ 563870, 3376640	
D9	Mullet Creek Disposal Site	EJ 565050, 3376510	X
D10	C-52 Drum Disposal Area	EJ 562790, 3379070	
D11	Munitions Disposal Area	EJ 563830, 3377800	
D12	C-80C Hardfill	EJ 561825, 3389625	
D13	Old Field No. 1 Landfill	EJ 561200, 3393440	
D14	Isotope Burial Area	EJ 564055, 3395020	
D15	Field No. 2 North Sanitary Landfill/Hardfill	EJ 553330, 3383640	
D16	Field No. 2 East Sanitary Landfill	EJ 554310, 3383650	X
D17	Field No. 2 Drum Disposal Site	EJ 553350, 3381670	X
D18	Valparaiso - Niceville Landfill	EJ 547260, 3379450	X
D21	Old Field No. 5 Sanitary Landfill	EJ 535530, 3383000	
D22	Field No. 6 Sanitary Landfill	EJ 525620, 3390730	

TABLE D.2 (Continued)
MASTER LIST OF PAST WASTE DISPOSAL LOCATIONS

Site No.	Site Description	UTM Coordinates	Hazardous Waste: Suspected Prese.
EGLIN RESERVATION (Continued)			
D23	Wolf Creek Drum Disposal Area	EJ 519650, 3384250	
D24	Old Field No. 7 Landfill	EJ 517900, 3377600	
D25	Holley Landfill	EJ 512050, 3368850	
D37	Wright Landfill	EJ 535940, 3370730	X
D38	Field No. 4 Landfill	EJ 540150, 3375150	
D39	A-15 Hardfill	EJ 518825, 3361950	X
D40	A-11A Disposal Site	EJ 527480, 3362300	
SP2	Field No. 3 Spray Area	EJ 546110, 3390500	
SP3	Field No. 6 Spray Area	EJ 525110, 3387575	
SP4	Plew Spray Area	EJ 541950, 3373150	
DUKE FIELD			
D19	Duke Field Sanitary Landfill	EJ 545340, 3391320	
D20	Duke Field Hardfill	EJ 544780, 3390800	
HURLBURT FIELD			
D26	Sanitary Landfill - Closed Nov. 1979	EJ 525600, 3365700	X
D27	Hardfill	EJ 527200, 3365600	
D28	Hardfill	EJ 527800, 3365650	
D29	Sanitary Landfill	EJ 528400, 3365800	X
D30	Sanitary Landfill	EJ 528040, 3365730	X
D31	Landfill	EJ 528180, 3365600	X
D32	Dry Landfill	EJ 528800, 3365700	X
D33	Sanitary Landfill	EJ 529000, 3366380	
D34	Sanitary Landfill	EJ 529100, 3366200	X

TABLE D.2
MASTER LIST OF PAST WASTE DISPOSAL LOCATIONS

Site No.	Site Description	UTM Coordinates	Hazardous Wastes Suspected Present
HURLBURT FIELD			
D35	Landfill	EJ 529480, 3364585	X
D36	Dry Landfill	EJ 530325, 3364760	
D41	E. O. D. Disposal Site	EJ 526400, 3365800	X
SP1	Mary Esther Spray Area	EJ 532680, 3371000	

TABLE D.3
MASTER LIST OF WASTE STORAGE FACILITIES

Site No.	Site Description	UTM Coordinates	Hazardous Waste Suspected Prese
EGLIN MAIN			
S1	Old CE Equipment Storage Yard	EJ 545270, 3371000	
S2	DPDO Drum Storage Yard	EJ 548080, 3371500	X
S3	CE Storage Yard	EJ 548700, 3371430	X
EGLIN RESERVATION			
S4	Empty Drum Storage Area	EJ 566890, 3385720	
HURLBURT FIELD			
S5	PCB Storage Building (Hurlburt Field)	EJ 529175, 3364875	X

TABLE D.4
MASTER LIST OF TEST AREA CONTAMINATION SITES

Site No.	Site Description	UTM Coordinates	Hazardous Wastes Suspected Present
T1	Herbicide Test Grid	EJ 566370, 3376035	X
T2	Pocosin Pond Test Area	EJ 532330, 3384330	
T3	Hardstand 7	EJ 546180, 3372820	X
T4	Field No. 2 Herbicide Unloading Area	EJ 553200, 3383250	
T5	C-64 Current DU Range	-	-
T6	C-74 Old DU Range	EJ 564860, 3395220	-

TABLE D.5
MASTER LIST OF INDUSTRIAL SHOPS WITH LOCAL DISPOSAL SITES

Site No.	Site Description	UTM Coordinates	Hazardous Waste Suspected Present
IS1	Missile Maintenance, Bldg. 1285	EJ 544875, 3373500	X
IS2	Electric Shop, Bldg. 136	EJ 546950, 3371500	X
IS3	Paint Shop, Bldg. 127	EJ 546700, 3371200	X
IS4	Welding/Electroplating, Bldg. 127	EJ 546700, 3371200	X
IS5	Flightline Drainage, NA	EJ 545350, 3389800	X
IS6	Allied Trades Paint Booth	EJ 529140, 3364800	X
IS7	Climatic Laboratory	EJ 547120, 3371360	X
IS8	HERD Facility	EJ 545870, 3373530	X

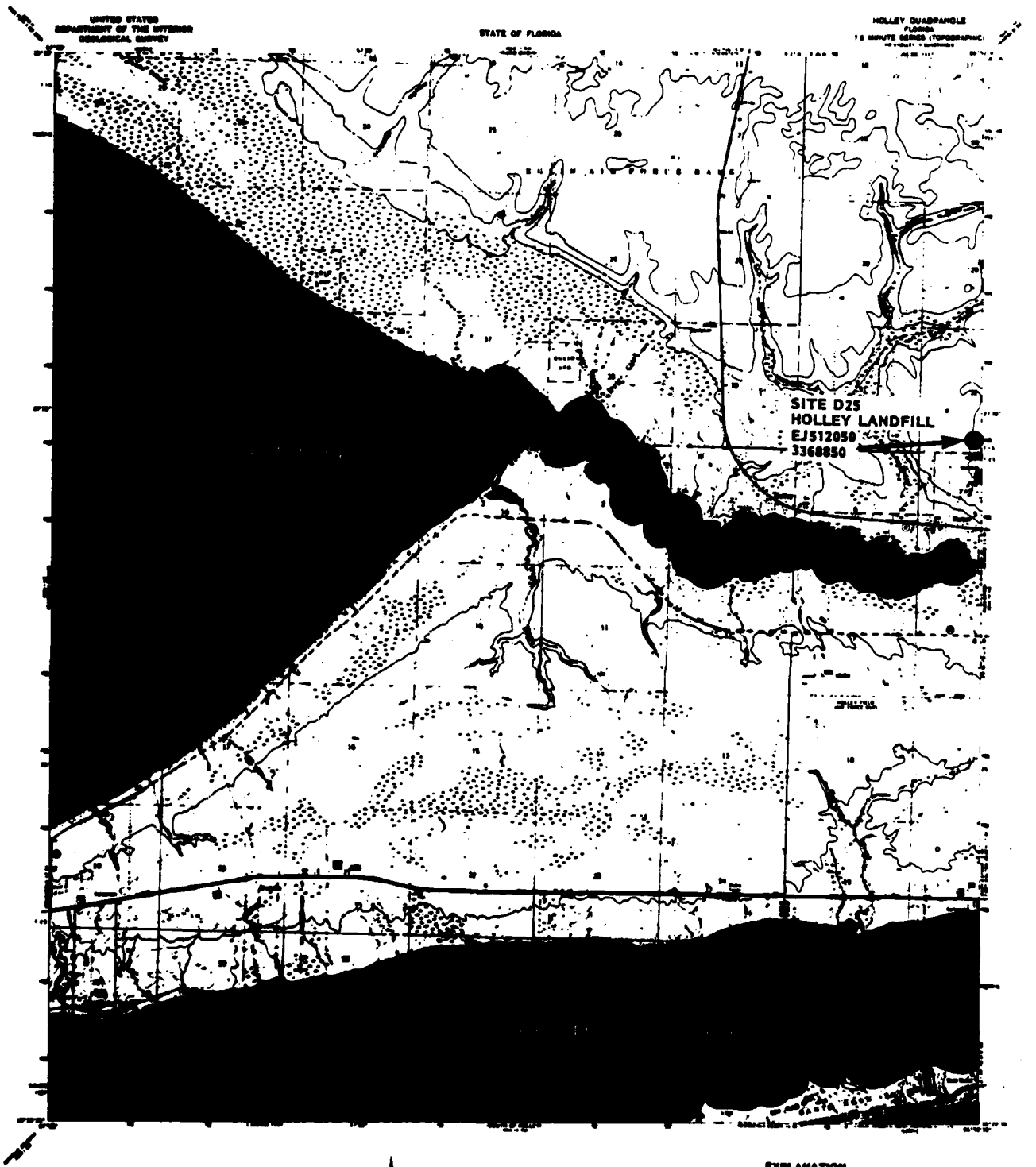
APPENDIX E

SITE LOCATION MAPS

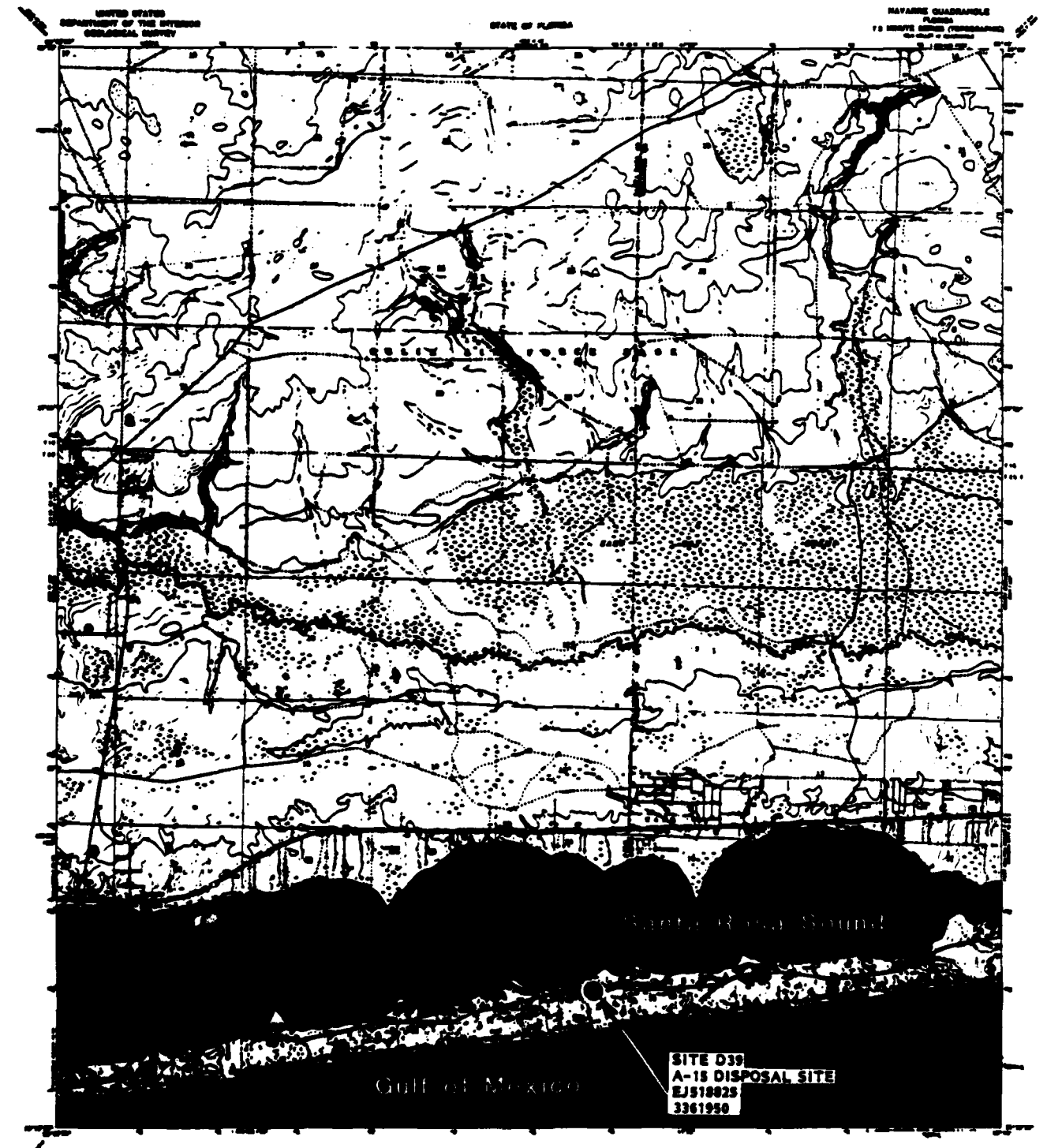
SITE LOCATION MAPS

TABLE OF CONTENTS

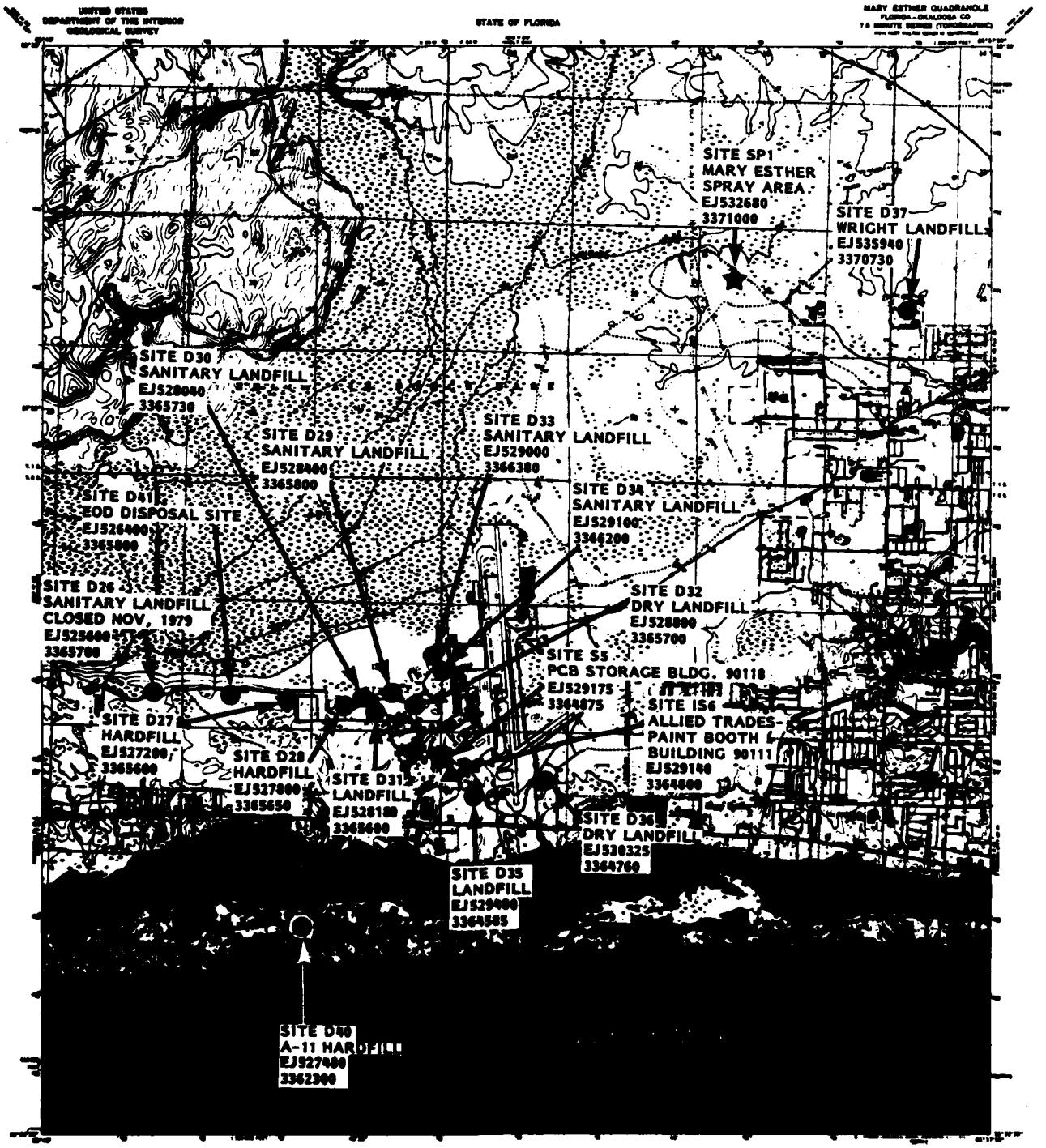
EGLIN AFB

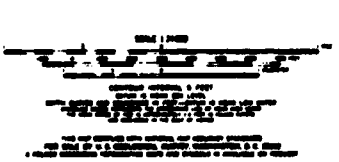

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
STATE OF FLORIDA
HOLLEY QUADRANGLE
FLORIDA
7.5 MINUTE SERIES (TOPOGRAPHIC)
SITE D25
HOLLEY LANDFILL
EJS12050
3368850
N
EXPLANATION
(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates
(2) SITE TYPES:
D ● Disposal Site
S ■ Storage Site
SP ★ Spray Area
T ◆ Test Area
IS ▲ Industrial Shop

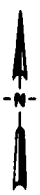
EGLIN AFB


Gulf of Mexico
SITE D39
A-15 DISPOSAL SITE
EJ518825
3361950
N
EXPLANATION
(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates
(2) SITE TYPES:
D Disposal Site
S Storage Site
SP Spray Area
T Test Area
IS Industrial Sites

EGLIN AFB







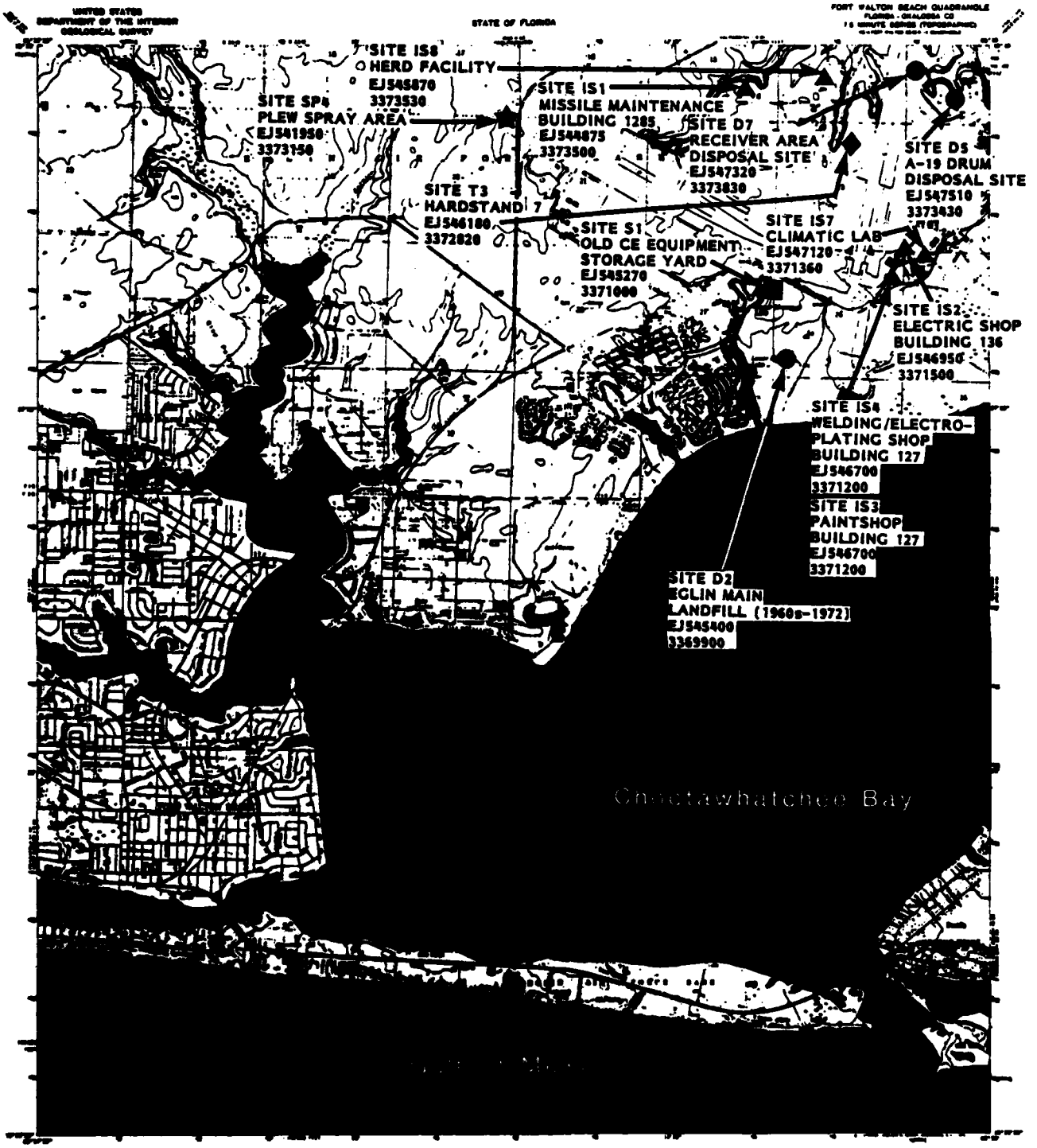
EXPLANATION

(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates

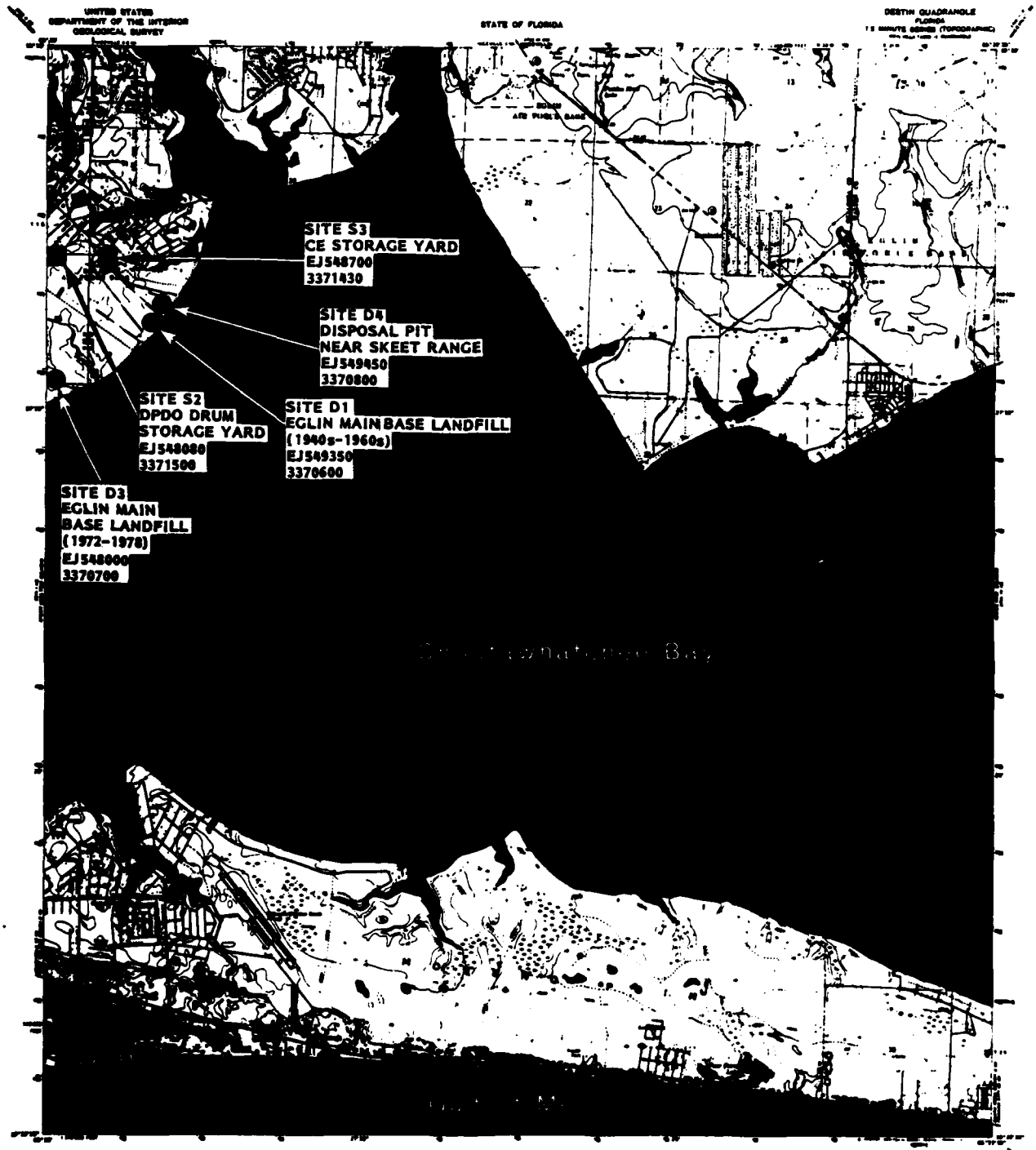
(2) SITE TYPES:

D	●	Disposal Site
S	■	Storage Site
SP	★	Spray Area
T	◆	Test Area
IS	▲	Industrial Shop

EGLIN AFB


UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY
STATE OF FLORIDA
FORT WALTON BEACH QUADRANGLE
SITE IS6
HERD FACILITY
EJ545870
3373530
SITE SP6
PLEW SPRAY AREA
EJ541950
3373150
SITE IS1
MISSILE MAINTENANCE
BUILDING 1285
EJ544875
3373500
SITE D7
RECEIVER AREA
DISPOSAL SITE
EJ547320
3373830
SITE D5
A-19 DRUM
DISPOSAL SITE
EJ547510
3373430
SITE T3
HARDSTAND 7
EJ546180
3372820
SITE S1
OLD CE EQUIPMENT
STORAGE YARD
EJ545270
3371000
SITE IS7
CLIMATIC LAB
EJ547120
3371360
SITE IS2
ELECTRIC SHOP
BUILDING 136
EJ546950
3371500
SITE IS4
WELDING/ELECTRO-
PLATING SHOP
BUILDING 127
EJ546700
3371200
SITE IS3
PAINTSHOP
BUILDING 127
EJ546700
3371200
SITE D2
EGLIN MAIN
LANDFILL (1960s-1972)
EJ545400
3369900
Choctawhatchee Bay
-N-
EXPLANATION
(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates
(2) SITE TYPES:
D Disposal Site
S Storage Site
SP Spray Area
T Test Area
IS Industrial Shop

EGLIN AFB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SITE D4
DISPOSAL PIT
NEAR SKEET RANGE
EJ549450
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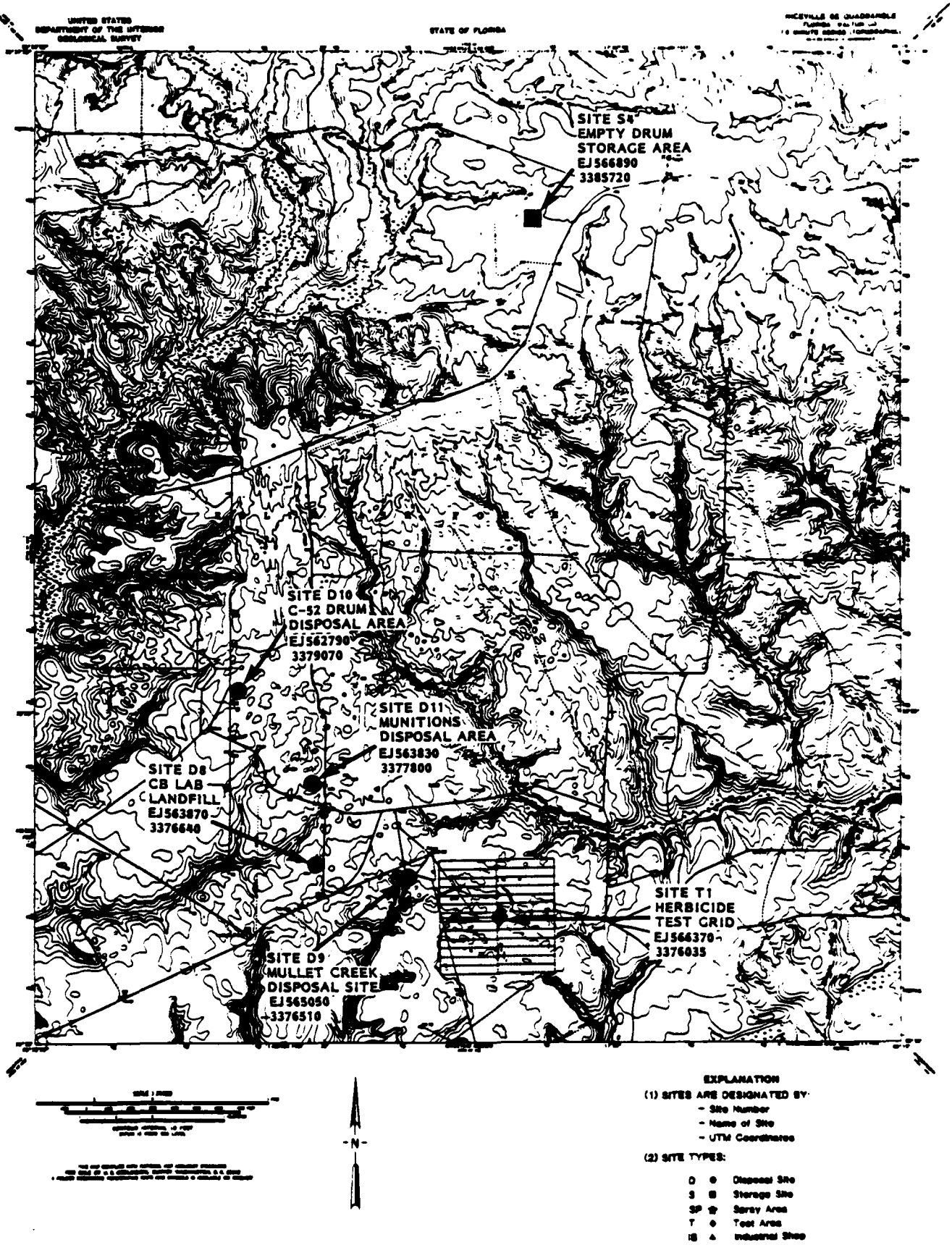
SITE S2
DPDO DRUM
STORAGE YARD
EJ548080
3371500
SITE D1
EGLIN MAIN BASE LANDFILL
(1940s-1960s)
EJ549350
3370600
SITE D3
EGLIN MAIN
BASE LANDFILL
(1972-1978)
EJ548000
3370700
N
EXPLANATION
(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates
(2) SITE TYPES:
D Disposal Site
S Storage Site
SP Spray Area
T Test Area
IS Industrial Shop

EGLIN AFB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SITE D11
MUNITIONS
DISPOSAL AREA
EJ563830
3377800
SITE D8
CB LAB
LANDFILL
EJ563870
3376640
SITE T1
HERBICIDE
TEST GRID
EJ566370
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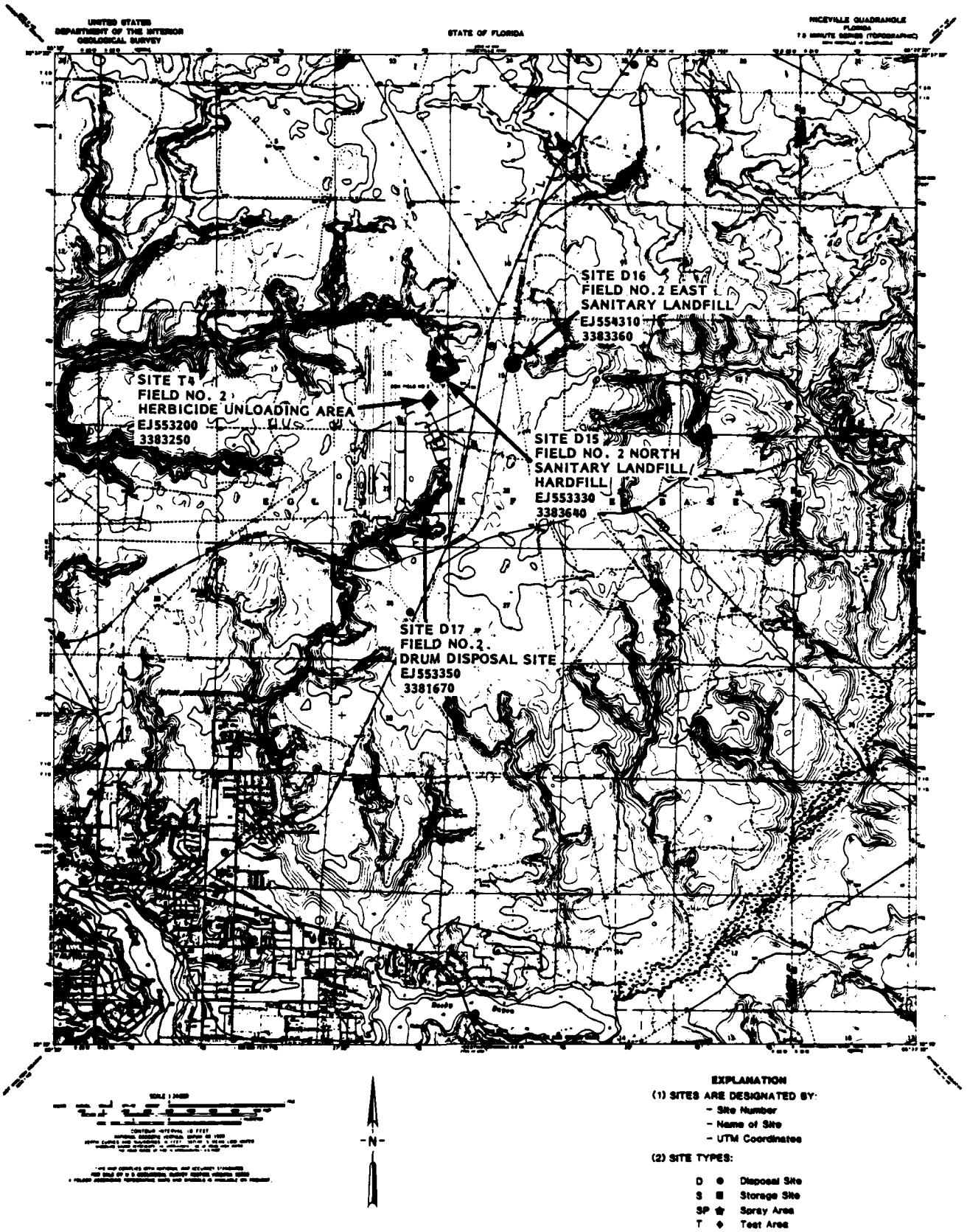
SITE D9
MULLET CREEK
DISPOSAL SITE
EJ565050
3376510
-N-
EXPLANATION
(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates
(2) SITE TYPES:
D Disposal Site
S Storage Site
SP Spray Area
T Test Area
IS Industrial Shop

EGLIN AFB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DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
STATE OF FLORIDA
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SITE T4
FIELD NO. 2
HERBICIDE UNLOADING AREA
EJ553200
3383250
SITE D15
FIELD NO. 2 NORTH
SANITARY LANDFILL/
HARDFILL
EJ553330
3383640
SITE D17
FIELD NO. 2
DRUM DISPOSAL SITE
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3381670
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EXPLANATION
(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates
(2) SITE TYPES:
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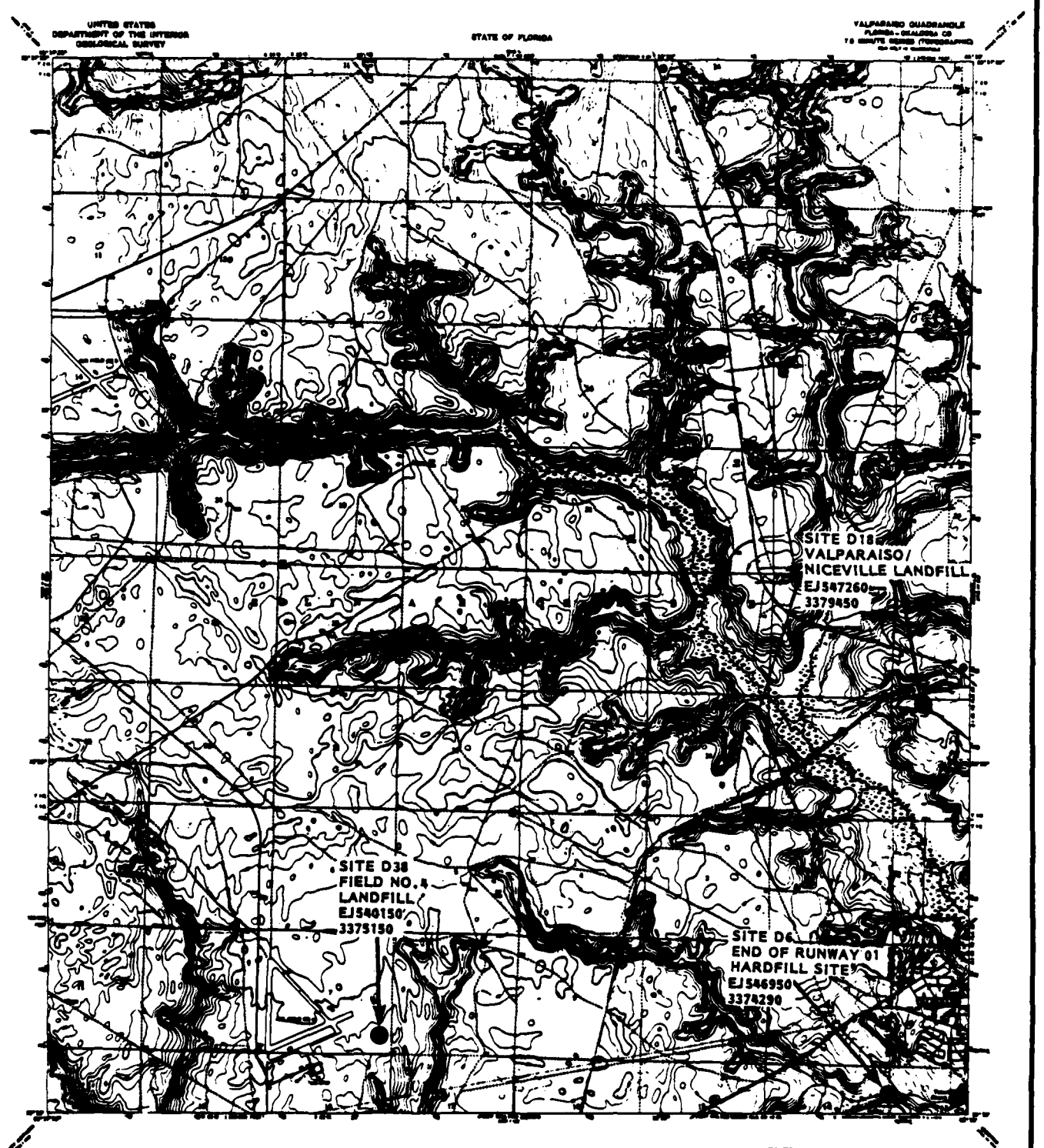
S Storage Site
SP Spray Area
T Test Area
IS Industrial Shop

EGLIN AFB



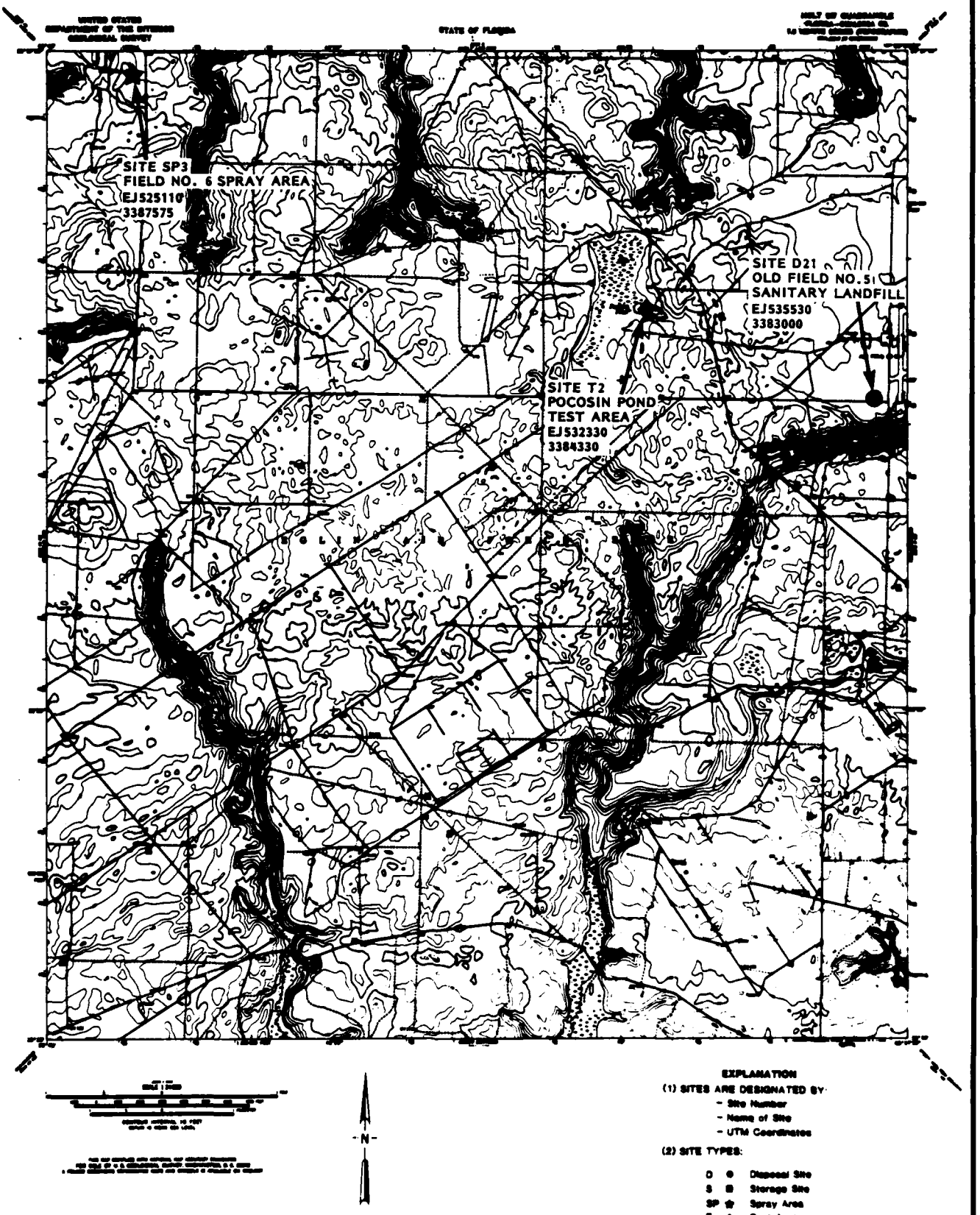
EXPLANATION

(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates

(2) SITE TYPES:

D	●	Disposal Site
S	■	Storage Site
SP	★	Spray Area
T	◆	Test Area
IS	▲	Industrial Shop

EGLIN AFB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SITE T2
POCOSIN POND
TEST AREA
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3384330
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EXPLANATION
(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates
(2) SITE TYPES:
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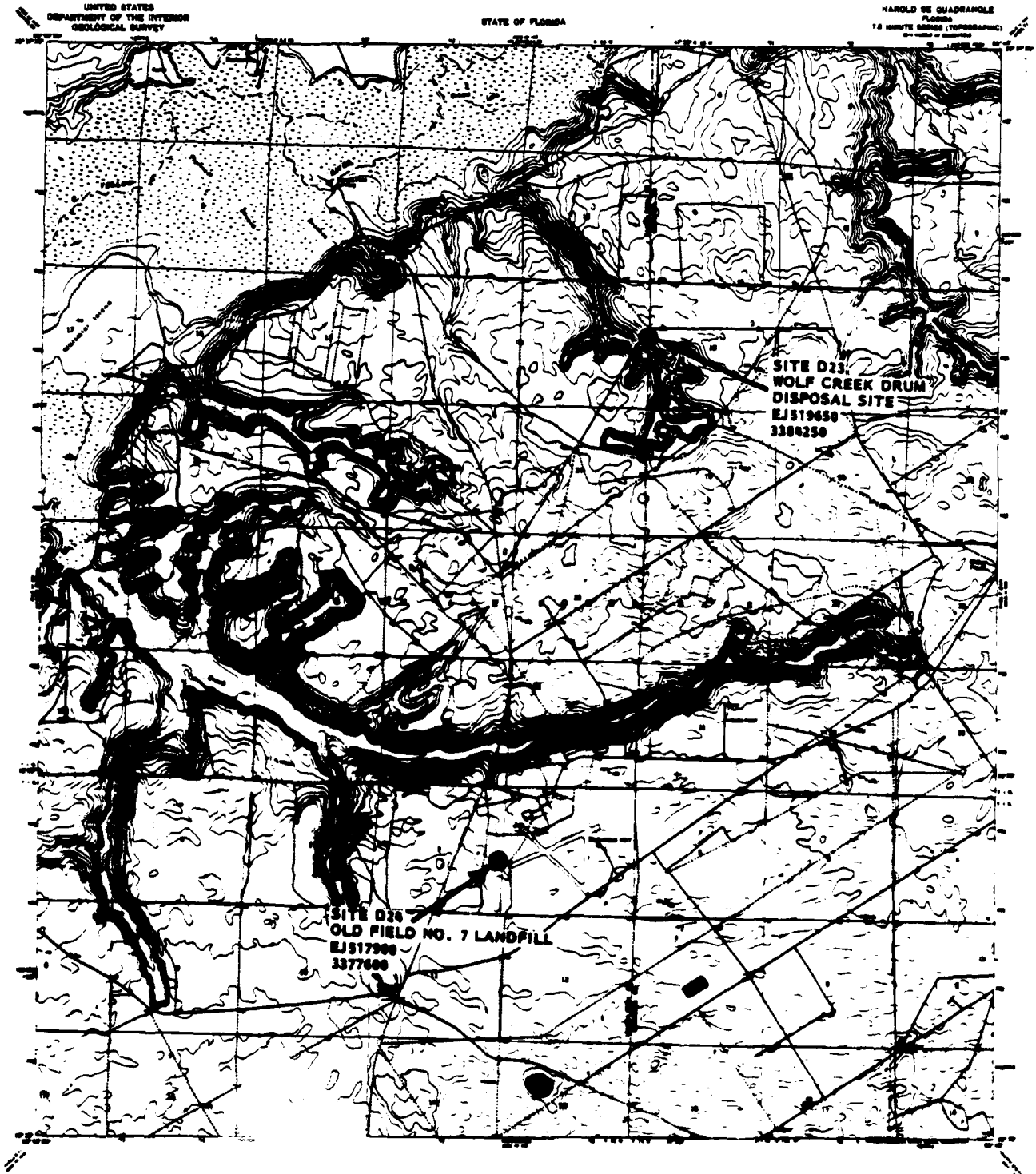
S Storage Site
SP Spray Area
T Test Area
IS Industrial Site

EGLIN AFB


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
STATE OF FLORIDA
HAROLD SE QUADRANGLE
FLORIDA
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DISPOSAL SITE
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SITE D24
OLD FIELD NO. 7 LANDFILL
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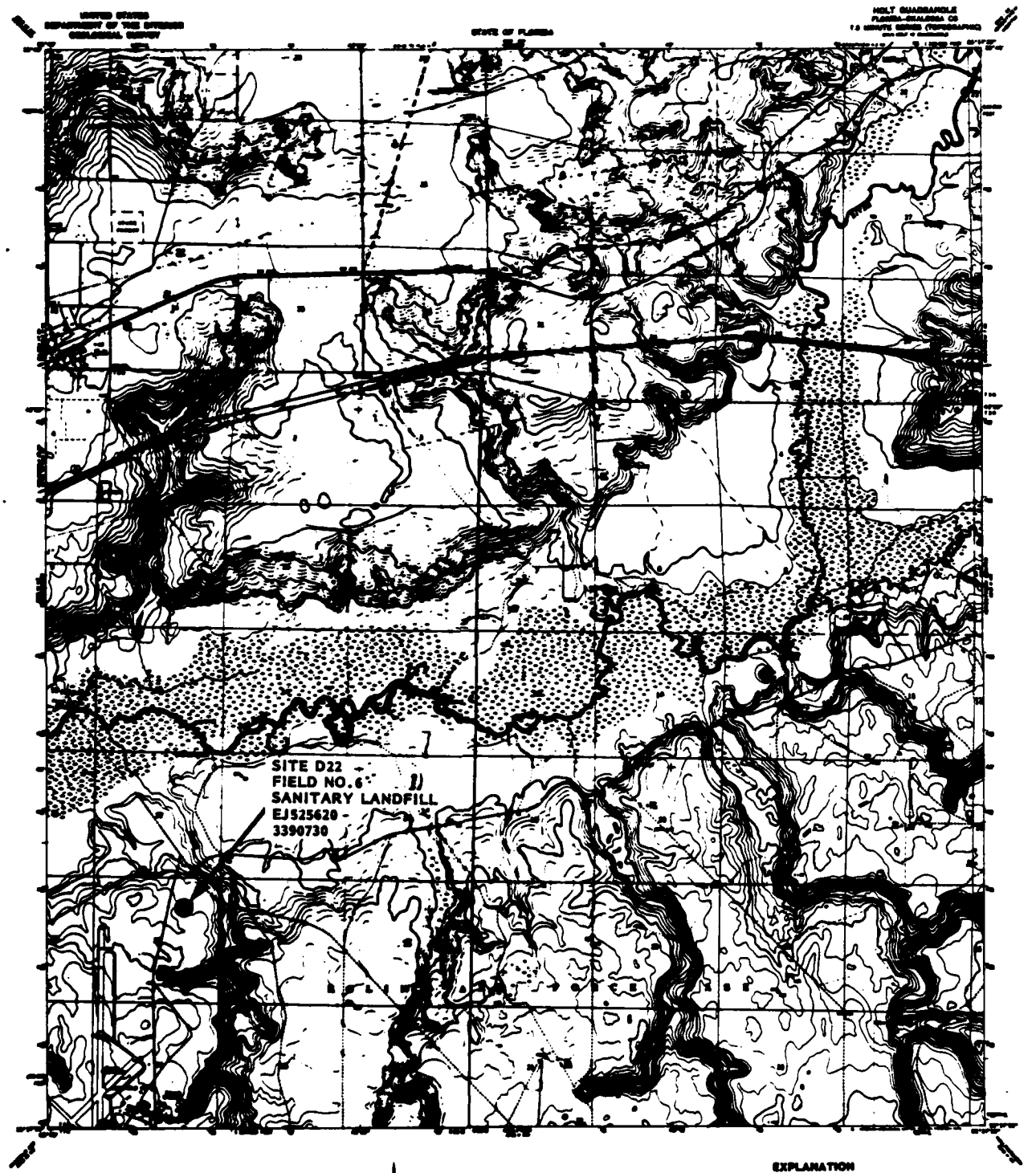
3377600
-N-
EXPLANATION
(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates
(2) SITE TYPES:
D - Disposal Site
S - Storage Site
SP - Spray Area
T - Test Area
I - Industrial Shop

EGLIN AFB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SANITARY LANDFILL
EJ525620 -
3390730
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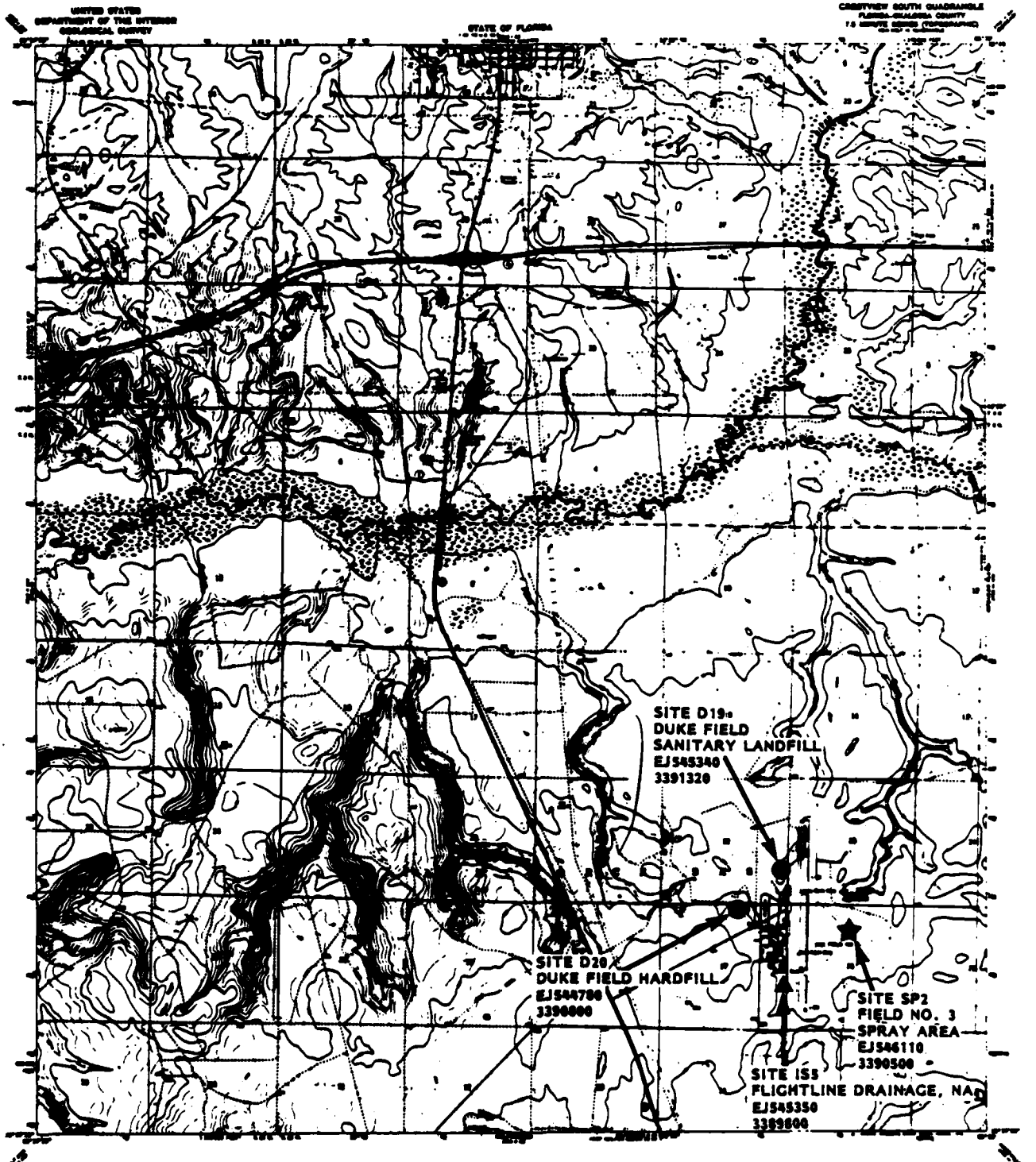
- Site Number
- Name of Site
- UTM Coordinates
(2) SITE TYPES:
D Disposal Site
S Storage Site
SP Spray Area
T Test Area
IS Industrial Shop

EGLIN AFB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SANITARY LANDFILL
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SITE D20
DUKE FIELD HARDFILL
EJ544780
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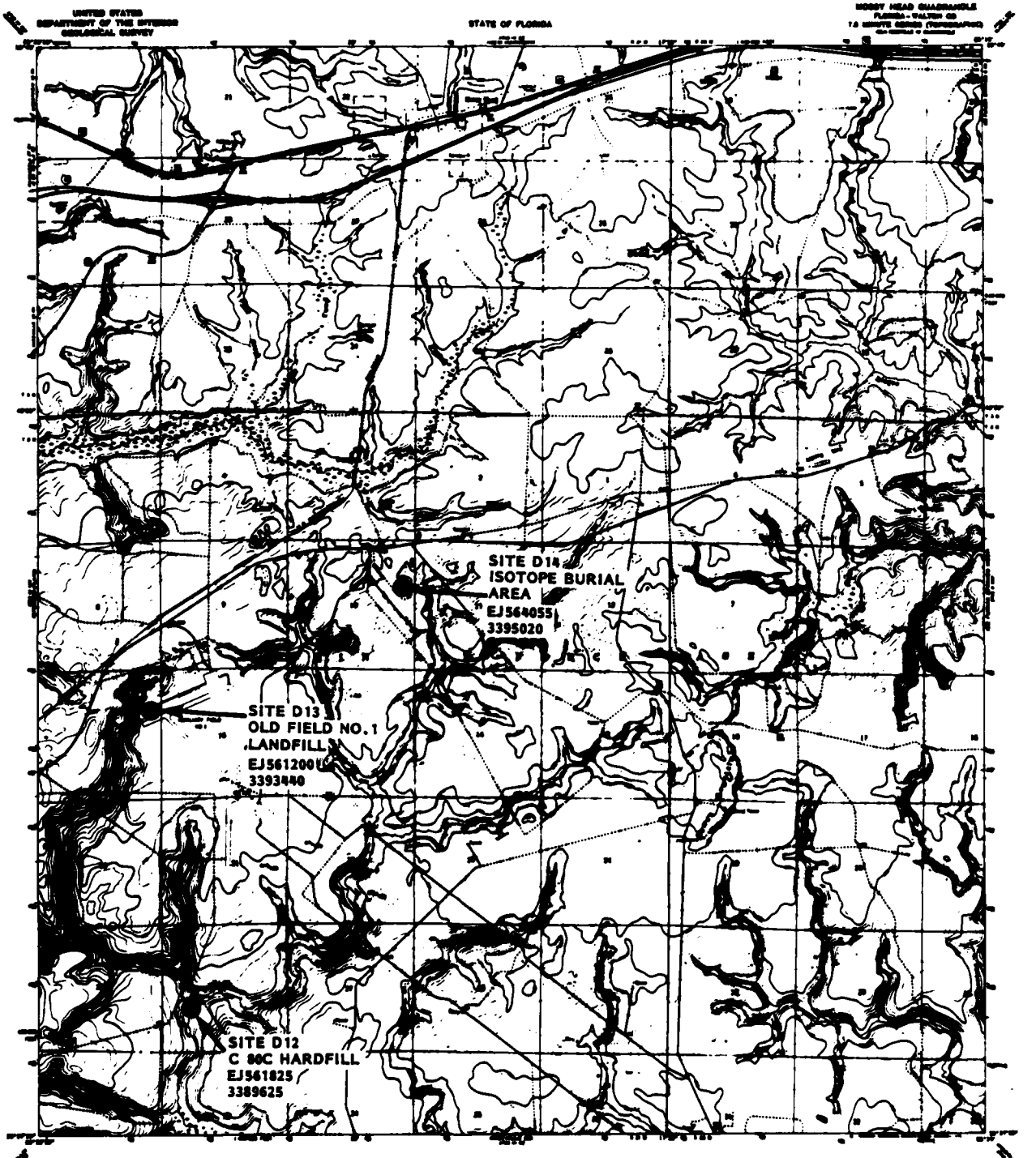
SITE SP2
FIELD NO. 3
SPRAY AREA
EJ546110
3390500
SITE IS5
FLIGHTLINE DRAINAGE, NA
EJ545350
3389600
N
EXPLANATION
(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates
(2) SITE TYPES:
D Disposal Site
S Storage Site
SP Spray Area
T Test Area

EGLIN AFB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AREA
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SITE D13
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LANDFILL
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SITE D12
C 80C HARDFILL
EJ561825
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EXPLANATION
(1) SITES ARE DESIGNATED BY:
- Site Number
- Name of Site
- UTM Coordinates
(2) SITE TYPES:
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SP Spray Area
T Test Area
IS Industrial Shop

APPENDIX F

GLOSSARY OF TERMINOLOGY AND ABBREVIATIONS

APPENDIX F

GLOSSARY OF TERMINOLOGY AND ABBREVIATIONS

AAF: Auxiliary Airfield

Acft Maint: Aircraft Maintenance

AD: Air Force Systems Command's Armament Division

AD/DE: Directorate of Civil Engineering

AD/DEEVE: Environmental Protection Planning Section

AD/DEEVN: Natural Resources Planning Section

AD/PA: Public Affairs Office

AD/SGPE: Bioenvironmental Engineering Services

AF: Air Force

AFB: Air Force Base

AFFF: Fire Control Agent

AFR: Air Force Regulation

AFATL: Air Force Armament Test Lab

AFSC: Air Force Systems Command

AG: Adjutant General

AGE: Aircraft Ground Equipment

ARTESIAN: Ground water contained under hydrostatic pressure

AQUICLUDE: Poorly permeable formation that impeeds ground-water movement and does not yield water to a well or spring

AQUIFER: A geologic formation, group of formations, or part of a formation that is capable of yeilding water to a well or spring

AVGAS: Aviation Gasoline

AWADS: Airborne Warning and Detection System

BIOACCUMULATE: Tendency of elements or compounds to accumulate or build up in the tissues of living organisms when they are exposed to these elements in their environments, e.g., heavy metals

BOLD EAGLE: US Readiness Command Exercise Operation

BOWSER: Mobil Storage Tank

CERL: Construction Engineering Research Laboratory

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act

CES: Civil Engineering Squadron

CLOSURE: The completion of a set of rigidly defined functions for a hazardous waste facility no longer in operation

COD: Chemical Oxygen Demand, a measure of the amount of oxygen required to oxidize organic and oxidizable inorganic compounds in water

CONFINED AQUIFER: An aquifer bounded above and below by impermeable beds or by beds of distinctly lower permeability than that of the aquifer itself

CONTAMINATION: The degradation of natural water quality to the extent that its usefulness is impaired; there is no implication of any specific limits since the degree of permissible contamination depends upon the intended end use or uses of the water

CRS: Component Repair Squadron

DASC: Direct Air Support Center

DDT: 1,1,1 - Trichloro - 2,2,-bis (p-chlorophenyl) - ethane; a pesticide

DER: Department of Environmental Regulation

DESPOSAL FACILITY: A facility or part of a facility at which hazardous waste is intentionally placed into or on land or water, and at which waste will remain after closure

DISPOSAL OF HAZARDOUS WASTE: The discharge, deposit, injection, dumping, spilling, or placing of any hazardous waste into or on land or water so that such waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground water

D.O.: Dissolved Oxygen

DOD: Department of Defense

DOWNGRADIENT: In the direction of lower hydraulic head; the direction in which ground water flows

DPDO: Defense Property Disposal Office

DUMP: An uncovered land disposal site where solid and/or liquid wastes are deposited with little or no regard for pollution control or aesthetics; dumps are susceptible to open burning and are exposed to the elements, disease vectors and scavengers

EFFLUENT: A liquid waste discharge from a manufacturing or treatment process, in its natural state, or partially or completely treated, that discharges into the environment

EOD: Explosive Ordnance Detachment

EPA: Environmental Protection Agency

EROSION: The wearing away of land surface by wind or water

FACILITY: Any land and appurtenances thereon and thereto used for the treatment, storage and/or disposal of hazardous wastes

FCT: Fire Control Training

FDER: Florida Department of Environmental Regulations

FLOOD PLAIN: The lowland and relatively flat areas adjoining inland and coastal areas of the mainland and off-shore islands, including, at a minimum, areas subject to a one percent or greater chance of flooding in any given year

FLOW PATH: The direction or movement of ground water and any contaminants that may be contained therein, as governed principally by the hydraulic gradient

GROUNDWATER: Water beneath the land surface in the saturated zone that is under atmospheric or artesian pressure

GROUND WATER RESERVOIR: The earth materials and the intervening open spaces that contain ground water

HALF-LIFE: The time required for half the atoms present in radioactive substance to disintegrate

HARDFILL: Disposal sites receiving construction debris, wood, miscellaneous spoil material

HAZARDOUS MATERIAL: A material defined as hazardous under RCRA or CERCLA

HAZARDOUS WASTE: A solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed

HAZARDOUS WASTE GENERATION: The act or process of producing a hazardous waste

HEAVY METALS: Metallic elements, including the transition series, which include many elements required for plant and animal nutrition in trace concentrations but which become toxic at higher concentrations

HERBICIDE BLUE: Organic Arsenic

HERBICIDE ORANGE: 50/50 mixture of 2,4-D (2,4 dichlorophenoxyacetic acid) and 2,4,5-T (2,4,5 - Trichlorophenoxyacetic acid)

HERD: High Explosives Research and Development Facility

HQ: Headquarters

HWMF: Hazardous Waste Management Facility

INCOMPATIBLE WASTE: A waste unsuitable for commingling with another waste or material because the commingling might result in generation of extreme heat or pressure, explosion or violent reaction, fire, formation of substances which are shock sensitive, friction sensitive, or otherwise have the potential for reacting violently, formation of toxic dusts, mists, fumes, and gases, volatilization of ignitable or toxic chemicals due to heat generation in such a manner that the likelihood of contamination of ground water or escape of the substance into the environment is increased, any other reaction which might result in not meeting the Air, Human Health, and Environmental Standard

INFILTRATION: The flow of liquid through pores or small openings

IRP: Installation Restoration Program

ISOTOPE: Two or more species of atoms of the same chemical element, with the same atomic number and place in the periodic table, and nearly identical chemical properties, but with different atomic mass numbers and different physical properties; an example may be the radioactive isotope - Carbon (12) and Carbon-14

kg: Kilogram-

km: Kilometer

LEACHATE: A solution resulting from the separation or dissolving of soluble or particulate constituents from solid waste or other man-placed medium by percolation of water

LEACHING: The process by which soluble materials in the soil, such as nutrients, pesticide chemicals or contaminants, are washed into a lower layer of soil or are dissolved and carried away by water

LINER: A continous layer of natural or man-made materials beneath or on the sides of a surface impoundmnet, landfill, or landfill cell which restricts the downward or lateral escape of hazardous waste, hazardous waste constituents or leachate

mg/l: Milligrams per liter

mil: 0.001 inch

ml: Milliliter

mm: Millimeter

MGD: Million gallons per day

MOA: Military Operating Area

MONITORING WELL: A well used to measure ground-water levels and to obtain samples

MSL: Mean Sea Level

NSA: Naval Air Station

ORGANIC: Being, containing or relating to carbon compounds, especially in which hydrogen is attached to carbon

PCB: Polychlorinated Biphenyls are highly toxic to aquatic life; they persist in the environment for long periods and are biologically accumulative

PERCOLOATION: Movement of moisture by gravity or hydrostatic pressure thorugh interstices of unsaturated rock or soil

PD-680: Cleaning solvent

pH: Negative logarithm of hydrogen ion concentration

PL: Public Law

POL: Petroleum, Oils and Lubricants

POLLUTANT: Any introduced gas, liquid or solid that makes a resource unfit for a specific purpose

RCRA: Resource Conservation and Recovery Act

RECHARGE AREA: An area in which water is absorbed that eventually reaches the zone of saturation in one or more aquifers

RECHARGE: The addition of water to the ground-water system by natural or artificial processes

RECON: Reconnaissance

SANITARY LANDFILL: A land disposal site using an engineered method of disposing solid wastes on land in a way that minimizes enviromental hazards

SATURATED ZONE: That part of the earth's crust in which all voids are filled with water

SLUDGE: The solid residue resulting from a manufacturing or wastewater treatment process which also produces a liquid stream

SOLID WASTE: Any garbage, refuse, or sludge from a waste treatment plant, water suply treatment, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, or agricultural operations and from community activities, but does not include solid or dissolved materials in domestic sewage; solid or dissolved materials in irrigation return flows; industrial discharges which are point source subject to permits under Section 402 of the Federal Water Pollution Control Act, as amended (86 USC 880); or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954 (68 USC 923)

SPILL: Any unplanned release or discharge of a hazardous waste onto or into the air, land, or water

STORAGE OF HAZARDOUS WASTE: Containment, either on a temporary basis or for a period of years, in such a manner as not to constitute disposal of such hazardous waste

TA: Test Area

TAC: Tactical Air Command

TCCD: Tetrachlorodibenzo-P-Dioxin

TFS: Tactical Fighter Squadron

TFW: Tactical Fighter Wing

TOXICITY: The ability of a material to produce injury or disease upon exposure, ingestion, inhalation, or assimilation by a living organism

TRANSMISSIVITY: The rate at which water is transmitted through a unit width under a unit hydraulic gradient

TREATMENT OF HAZARDOUS WASTE: Any method, technique, or process including neutralization designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize the waste or so as to render the waste nonhazardous

TS: Test Site

µg/l: Micrograms per liter

USAF: United States Air Force

UTM: Universal Transverse Mercator Coordinate System

WATER TABLE: Surface of a body of unconfined ground water at which the pressure is equal to that of the atmosphere

WL: Waste Lagoon

APPENDIX G

HAZARD EVALUATION METHODOLOGY

APPENDIX G

HAZARD EVALUATION METHODOLOGY

PRELIMINARY POTENTIAL CONTAMINATION ASSESSMENT

Various numerical methods for preliminary assessment of sites to determine the need of follow-up action have been developed. Under the auspices of EPA's Office of Enforcement, JRB Associates have devised a methodology for selecting sites for further investigation based on their potential for adverse environmental impact. A modified JRB technique has been developed by Engineering-Science and CH_2M Hill for analysis of the Phase I IRP studies (see memorandum dated July 8, 1981 at end of this Appendix). The methodology relies primarily on available information but does provide some mechanisms for handling missing data so that sites can be preliminarily rated in most cases. A brief discussion of the rating factor system of analysis follows.

Site Rating Factor System

The following four basic assessment criteria categories are used in the evaluation:

- Receptors
- Pathways
- Waste Characteristics, and
- Waste Management Practices

These categories have been further broken down into 31 generally applicable rating factors as presented in Table G-1. For each of the factors, a four-level rating scale has been developed ranging from "0" (indicating no potential hazard) to "3" (indicating a high potential hazard). These rating scales are also presented in Table G-1. It should be pointed out that these scales have been devised so that rating factors can typically be evaluated on the basis of readily available information from published materials public and private records, interviews with knowledgeable parties and site visits.

TABLE G.1

RATING FACTOR SYSTEM

RATING FACTORS	RATING SCALE LEVELS 0	1	2	3
		RECEPTORS		
Population Within 1,000 Feet	0	1 to 25	26 to 100	Greater than 100
Distance to Nearest Drinking Water Well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 3,000 feet
Distance to Reservation Boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet
Land Use/Zoning	Completely remote (zoning not applicable)	Agricultural	Commercial or industrial	Residential
Critical Environments	Not a critical environment	Pristine natural areas	Wetlands, floodplains, and preserved areas; presence of economically important natural resources	Major habitat of an endangered or threatened species; presence of recharge area
Water Quality Designation of Nearest Surface Water Body	Agricultural or industrial use	Recreation, propagation and management of fish & wildlife	Shellfish propagation and harvesting	Potable water supplies

TABLE G.1

RATING FACTOR SYSTEM (cont'd)

RATING FACTORS	RATING SCALE LEVELS 0	1	2	3
		PATHWAYS		
Evidence of Water Contamination	No contamination	Indirect evidence	Positive proof from direct observation	Positive proof from laboratory analyses
Level of Water Contamination	No contamination	Low levels, trace levels, or levels less than maximum contaminant level (MCL) or EPA drinking water standards	Moderate levels or levels near MCL or EPA drinking water standards	High levels greater than MCL or EPA drinking water standards
Type of Contamination - Soil/ Biota	No contamination	Suspected contamination	Moderate contamination	Severe contamination
Distance to Nearest Surface Water	Greater than 1 mile	2,001 ft to 1 mile	501 ft. to 2,000 ft.	0 to 500 ft.
Depth to Groundwater	Greater than 500 ft.	51 to 500 ft.	11 to 50 ft.	0 to 10 ft.
Net Precipitation	Less than -10 in.	-10 to +5 in.	+5 to +20 in.	Greater than +20 in.
Soil Permeability	Greater than 50% clay ($<10^{-6}$ cm/s)	30% to 50% clay (10^{-4} to 10^{-6} cm/s)	15% to 30% clay (10^{-2} to 10^{-4} cm/s)	0 to 15% clay ($>10^{-2}$ cm/s)
Bedrock Permeability	Impermeable ($<10^{-6}$ cm/s)	Relatively impermeable (10^{-4} to 10^{-6} cm/s)	Relatively permeable (10^{-2} to 10^{-4} cm/s)	Very permeable ($>10^{-2}$ cm/s)
Depth to Bedrock	Greater than 60 ft.	31 to 60 ft.	11 to 30 ft.	0 to 10 ft.
Surface Erosion	None	Slight	Moderate	Severe

TABLE G.1

RATING FACTOR SYSTEM (cont'd)

WASTE CHARACTERISTICS

Judgemental hazardous rating from 30 to 100 points based on the following guidelines:

Points	Condition
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantities of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

Hazardous waste rating shall consider such characteristics as toxicity, radioactivity, persistence, ignitability, reactivity, corrosivity, solubility, volatility, and physical state.

TABLE G.1

RATING FACTOR SYSTEM (con'd)

RATING FACTORS	RATING SCALE LEVELS 0	1	2	3
	WASTE MANAGEMENT PRACTICES			
Record Accuracy and Ease of Access to Site	Accurate records, no unauthorized dumping	Accurate records, no barriers	Incomplete records, no barriers	No records, no barriers
Hazardous Waste Quantity	<1 ton	1 to 5 tons	5 to 20 tons	>20 tons
Total Waste Quantity	0 to 10 acre ft.	11 to 100 acre ft.	101 to 250 acre ft.	Greater than 250 acre ft.
Waste Incompatibility	No incompatible wastes are present	Present, but does not pose a hazard	Present and may pose a future hazard	Present and posing an immediate hazard
Absence of Liners or Confining Strata	Liner and confining strata	Liner or confining strata	Low quality liner or low permeability strata	No liner, no confining strata
Use of Leachate Collection Systems	Adequate collection and treatment	Inadequate collection or treatment	Inadequate collection and treatment	No collection or treatment
Use of Gas Collection Systems	Adequate collection and treatment	Collection and controlled flaring	Venting or inadequate treatment	No collection or treatment
Site Closure	Impermeable cover	Low permeability cover	Permeable cover	Abandoned site, no cover
Subsurface Flows	Bottom of landfill greater than 5 ft. above high groundwater level	Bottom of landfill occasionally submerged	Bottom of fill frequently submerged	Bottom of fill located below mean groundwater level

Since the rating factors do not all assess the same magnitude of potential environmental impact, a numerical multiplier has been assigned to each factor. These multipliers were developed to indicate the relative magnitude of impact of that factor. In addition, weighting factors have been assigned to the Factor Subscores to arrive at a properly balanced Overall Score.

The following five hazard potential scores are the result of a site rating:

- Overall Score
- Receptors Subscore
- Pathways Subscore
- Waste Characteristics Subscore, and
- Waste Management Subscore.

M E M O R A N D U M

TO: Mr. Bernard Lindenberg, AFESC, Tyndall AFB, FL
Major Gary Fishburn, USAF OEHL, Brooks AFB, TX

FROM: Norman N. Hatch, Jr., CH2M HILL, Gainesville, FL NNH 7/8
Ernest J. Schroeder, Engineering-Science, Atlanta, GA 7/8

DATE: July 8, 1981

SUBJECT: Joint Meeting between CH2M HILL and Engineering-Science to develop a uniform site rating system for use in all Air Force Installation Restoration Program Records Search Projects

MEETING
LOCATION: CH2M HILL, Gainesville, Florida office

MEETING
DATE: Monday, June 29, 1981

A. Introduction and Purpose

A joint meeting was held at the CH2M HILL Gainesville, Florida office on Monday, June 29, 1981. The purpose of the meeting was to develop a uniform site rating system for use in all upcoming Air Force Installation Restoration Program Records Search projects. Attendees at the meeting included:

- Norman N. Hatch, Jr., CH2M HILL Representative
- Ernest J. Schroeder, Engineering-Science Representative
- Major Gary Fishburn, Air Force Observer

The basis for the rating system is the document developed by JRB Associates, Inc., McLean, Virginia, for the EPA Hazardous Waste Enforcement Office, Washington, D.C. The above document presents a methodology for selecting sites for investigation based on their potential for adverse environmental impact. Careful scrutiny of this document by CH2M HILL and Engineering-Science indicated that the rating system could readily be used, with some modifications, for evaluating Air Force installation sites.

These modifications would be necessary for the following reasons:

1. The methodology presented in the JRB document was developed primarily for large landfill operations throughout the nation. Modifications are necessary to accurately address specific Air Force installation conditions.

2. The rating system must include an equivalent comparison of landfill sites and suspected contaminated sites other than landfills, e.g., PCB spills.

B. Modifications to the JRB Rating System

The specific modifications jointly developed by CH2M HILL and Engineering-Science, based on experience in performing Record Searches at several Air Force installations, are presented in the revised JRB rating form and rating factor system (attached). The modifications, in general, are summarized below:

1. Changes in multipliers for several of the rating factors in the receptors, pathways, and waste management practices categories.

2. Deletion of several existing rating factors and addition of new rating factors in the receptors, pathways, and waste management practices categories.

3. Revision of the waste characteristics category.

4. Special considerations in the use of the waste management practices category to provide meaningful comparison of landfills and contaminated areas other than landfills. These special considerations include:

   a. Use of all nine rating factors for the evaluation of landfills.

   b. Deletion of non-applicable rating factors when evaluating other contaminated areas. The category score is then normalized to provide an equivalent comparison with landfills.

CONCLUSION

All parties present at the meeting agreed that the above modifications would provide a meaningful rating system for Air Force installation sites. The system will be used in the next several Record Searches and then re-evaluated to determine if further modifications are necessary.

NNH/EJS/lmr

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of Site _____

Location _____

Owner/Operator _____

Comments _____

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet		4		
Distance to Nearest Drinking Water Well		15		
Distance to Reservation Boundary		6		
Land Use/Zoning		3		
Critical Environments		12		
Water Quality of Nearby Surface Water Body		6		
Number of Assumed Values = ____ Out of 6		SUBTOTALS	_____	_____
Percentage of Assumed Values = ____%		SUBSCORE		_____
Number of Missing Values = ____Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = ____%				
PATHWAYS				
Evidence of Water Contamination		10		
Level of Water Contamination		15		
Type of Contamination, Soil/Biota		5		
Distance to Nearest Surface Water		4		
Depth to Groundwater		7		
Net Precipitation		6		
Soil Permeability		6		
Bedrock Permeability		4		
Depth to Bedrock		4		
Surface Erosion		4		
Number of Assumed Values = ____ Out of 10		SUBTOTALS	_____	_____
Percentage of Assumed Values = ____%		SUBSCORE		_____
Number of Missing Values = ____ Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = ____%				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE _____

Reason for Assigned Hazardous Rating:

WASTE MANAGEMENT PRACTICES

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
Record Accuracy and Ease of Access to Site		7		
Hazardous Waste Quantity		7		
Total Waste Quantity		4		
Waste Incompatibility		3		
Absence of Liners or Confining Beds		6		
Use of Leachate Collection System		6		
Use of Gas Collection Systems		2		
Site Closure		8		
Subsurface Flows		7		

Number of Assumed Values = ____ Out of 9

Percentage of Assumed Values = ____%

Number of Missing and Non-Applicable Values = ____ Out of 9

Percentage of Missing and Non-Applicalbe Values = ____%

SUBTOTALS _____ _____

SUBSCORE _____

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = ____ Out of 25

Overall Percentage of Assumed Values = ____%

OVERALL SCORE _____

(Receptors Subscore X 0.24 plus
Pathways Subscore X 0.33 plus
Waste Characteristics Subscore X 0.17 plus
Waste Management Subscore X 0.26)

RATING FACTOR SYSTEM GUIDELINES

RATING FACTORS	RATING SCALE LEVELS 0	1	2	3
RECEPTORS				
Population Within 1,000 Feet	0	1 to 25	26 to 100	Greater than 100
Distance to Nearest Drinking Water Well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 1,000 feet
Distance to Reservation Boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet
Land Use/Zoning	Completely remote (zoning not applicable)	Agricultural	Commercial or industrial	Residential
Critical Environments	Not a critical environment	Pristine natural areas	Wetlands, floodplains, and preserved areas; presence of economically important natural resources	Major habitat of an endangered or threatened species; presence of recharge area
Water Quality Designation of Nearest Surface Water Body	Agricultural or industrial use	Recreation, propagation and management of fish & wildlife	Shellfish propagation and harvesting	Potable water supplies
PATHWAYS				
Evidence of Water Contamination	No contamination	Indirect evidence	Positive proof from direct observation	Positive proof from laboratory analyses
Level of Water Contamination	No contamination	Low levels, trace levels, or levels less than maximum contaminant level (MCL) or EPA drinking water standards	Moderate levels or levels near MCL or EPA drinking water standards	High levels greater than MCL or EPA drinking water standards
Type of Contamination - Soil/ Biota	No contamination	Suspected contamination	Moderate contamination	Severe contamination
Distance to Nearest Surface Water	Greater than 1 mile	2,001 ft to 1 mile	501 ft. to 2,000 ft.	0 to 500 ft.
Depth to Groundwater	Greater than 500 ft.	51 to 500 ft.	11 to 50 ft.	0 to 10 ft.
Net Precipitation	Less than -10 in.	-10 to +5 in.	+5 to +20 in.	Greater than +20 in.
Soil Permeability	Greater than 50% clay ($<10^{-6}$ cm/s)	30% to 50% clay (10^{-4} to 10^{-6} cm/s)	15% to 30% clay (10^{-2} to 10^{-4} cm/s)	0 to 15% clay ($>10^{-2}$ cm/s)
Bedrock Permeability	Impermeable ($<10^{-4}$ cm/s)	Relatively impermeable (10^{-4} to 10^{-6} cm/s)	Relatively permeable (10^{-2} to 10^{-4} cm/s)	Very permeable ($>10^{-2}$ cm/s)
Surface Erosion	None	Slight	Moderate	Severe

WASTE CHARACTERISTICS

Judgemental hazardous rating from 30 to 100 points based on the following guidelines:

Points	Condition
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantities of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

RATING FACTORS	RATING SCALE LEVELS			
	0	1	2	3
	WASTE MANAGEMENT PRACTICES			
Record Accuracy and Ease of Access to Site	Accurate records, no unauthorized dumping	Accurate records, no barriers	Incomplete records, no barriers	No records, no barriers
Hazardous Waste Quantity	<1 ton	1 to 5 tons	5 to 20 tons	>20 tons
Total Waste Quantity	0 to 10 acre ft.	11 to 100 acre ft.	101 to 250 acre ft.	Greater than 250 acre ft.
Waste Incompatibility	No incompatible wastes are present	Present, but does not pose a hazard	Present and may pose a future hazard	Present and posing an immediate hazard
Absence of Liners or Confining Strata	Liner and confining strata	Liner or confining strata	Low quality liner or low permeability strata	No liner, no confining strata
Use of Leachate Collection Systems	Adequate collection and treatment	Inadequate collection or treatment	Inadequate collection and treatment	No collection or treatment
Use of Gas Collection Systems	Adequate collection and treatment	Collection and controlled flaring	Venting or inadequate treatment	No collection or treatment
Site Closure	Impermeable cover	Low permeability cover	Permeable cover	Abandoned site, no cover
Subsurface Flows	Bottom of landfill greater than 5 ft. above high groundwater level	Bottom of landfill occasionally submerged	Bottom of fill frequently submerged	Bottom of fill located below mean groundwater level

APPENDIX H

SITE RATING FORMS

SITE RATING FORMS

TABLE OF CONTENTS

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site D1 - Eglin Main Base Landfill (1940's-1950's)

Location UTM Coordinates: EJ549350 3370600

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	2	6	12	18
Land Use/Zoning	2	3	6	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	2	6	12	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	99	138
Percentage of Assumed Values = 0 %		SUBSCORE		72
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	2	15	30	45
Type of Contamination, Soil/Biota	2	5	10	15
Distance to Nearest Surface Water	2	4	8	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	127	195
Percentage of Assumed Values = 20 %		SUBSCORE		65
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 90

Reason for Assigned Hazardous Rating:

hydraulic fuels, waste oils, waste solvents, PCB capacitors, pesticide container, waste pesticide, fuel tank sludges

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	3	7	21	21
Total Waste Quantity	3	4	12	12
Waste Incompatibility	1	3	3	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	3	7	21	21
Number of Assumed Values = 2 Out of 9		SUBTOTALS	136	150
Percentage of Assumed Values = 22 %		SUBSCORE		91
Number of Missing and Non-Applicable Values = 0 Out of 9		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing and Non-Applicable Values = 0 %				

Overall Number of Assumed Values = 4 Out of 25

Overall Percentage of Assumed Values = 16 %

OVERALL SCORE 79

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

ASSESSMENT AND RATING FORM

Name of Site D2 - Eglin Main Base Landfill (Early 60's - 1972-73)

Location UTM Coordinates: EJ545400 3369900

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	2	6	12	18
Land Use/Zoning	2	3	6	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	93	138
Percentage of Assumed Values = 0 %		SUBSCORE		67
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	2	15	30	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	2	4	8	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	122	195
Percentage of Assumed Values = 20 %		SUBSCORE		63
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 90

Reason for Assigned Hazardous Rating:

hydraulic fuels, PCB capacitors, waste fuel oil, metal plating sludges, pesticide containers, waste solvents

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	2	7	14	21
Total Waste Quantity	3	4	12	12
Waste Incompatibility	1	3	3	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	3	7	21	21

Number of Assumed Values = 2 Out of 9
Percentage of Assumed Values = 22 %
Number of Missing and Non-Applicable Values = 0 Out of 9
Percentage of Missing and Non-Applicable Values = 0 %

SUBTOTALS 129 150
SUBSCORE 86
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 4 Out of 25
Overall Percentage of Assumed Values = 16 %

OVERALL SCORE 76

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site D41 - E.O.D. Disposal Site

Location UTM Coordinates: EJ526400 3365800

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	0	15	0	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	0	3	0	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	36	138
Percentage of Assumed Values = 0 %		SUBSCORE		26
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	2	10	20	30
Level of Water Contamination	2	15	30	45
Type of Contamination, Soil Biota	2	5	10	15
Distance to Nearest Surface Water	2	4	8	12
Depth to Groundwater	3	7	21	21
Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	1	4	4	12
Number of Assumed Values = 0 Out of 10		SUBTOTALS	141	195
Percentage of Assumed Values = 0 %		SUBSCORE		72
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 30

Reason for Assigned Hazardous Rating:

Napalm and unexploded ammo

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	2	7	14	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	3	7	21	21

Number of Assumed Values = 1 out of 9 — SUBTOTALS 114 150

Percentage of Assumed Values = 11 % — SUBSCORE 76

Number of Missing and Non-Applicable Values = 0 Out of 9 — (Factor Score Divided by Maximum Score and Multiplied by 100)

Percentage of Missing and Non-Applicable Values = 0 %

Overall Number of Assumed Values = 1 Out of 25

Overall Percentage of Assumed Values = 4 %

OVERALL SCORE 65

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND FILL AREA
ASSESSMENT AND RATING FORM

Name of Site D3 - Eglin Main Base Landfill (1972-73 - 1978)
Location UTM Coordinates: EJ548000 3370700
Owner/Operator
Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	2	6	12	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	69	138
Percentage of Assumed Values = 0 %		SUBSCORE		50
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil, Biota	3	5	15	15
Distance to Nearest Surface Water	2	4	8	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	117	195
Percentage of Assumed Values = 20 %		SUBSCORE		60
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 70

Reason for Assigned Hazardous Rating:

Waste solvents, Waste oils.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	2	7	14	21
Total Waste Quantity	2	4	8	12
Waste Incompatibility	1	3	3	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	2	7	14	21
Number of Assumed Values = 1 Out of 9		SUBTOTALS	118	150
Percentage of Assumed Values = 11 %		SUBSCORE		79
Number of Missing and Non-Applicable Values = 0 Out of 9		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing and Non-Applicable Values = 0 %				

Overall Number of Assumed Values = 3 Out of 25

Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 65

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site D26 - Sanitary Landfill - Closed Nov. 1979

Location UTM Coordinates: EJ525600 3365700

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	0	3	0	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	51	138
Percentage of Assumed Values = 0 %		SUBSCORE		37
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	2	10	20	30
Level of Water Contamination	2	15	30	45
Type of Contamination, Soil/Biota	2	5	10	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 0 Out of 10		SUBTOTALS	131	195
Percentage of Assumed Values = 0 %		SUBSCORE		68
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 70

Reason for Assigned Hazardous Rating:

Waste oils, solvents, PCB capacitors, waste treatment plant sludges, oil separator sludges, pesticide containers

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	2	7	14	21
Total Waste Quantity	1	4	4	12
Waste Incompatibility	1	3	3	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	3	7	21	21

Number of Assumed Values = 0 Out of 9

Percentage of Assumed Values = 0 %

Number of Missing and Non-Applicable Values = 0 Out of 9

Percentage of Missing and Non-Applicable Values = 0 %

SUBTOTALS 121 150

SUBSCORE 81

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 0 Out of 25

Overall Percentage of Assumed Values = 0 %

OVERALL SCORE 65

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site D40 - A-11A Disposal Site

Location UTM Coordinates: EJ527480 3362300

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	3	6	18	18
Land Use/Zoning	0	3	0	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	2	6	12	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	99	138
Percentage of Assumed Values = 0 %		SUBSCORE		72
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	2	10	20	30
Level of Water Contamination	2	15	30	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	136	195
Percentage of Assumed Values = 20 %		SUBSCORE		70
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:
Waste oil, waste solvents and drums disposed here.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	1	3	3	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	2	7	14	21

Number of Assumed Values = 2 Out of 9
Percentage of Assumed Values = 22 %
Number of Missing and Non-Applicable Values = 0 Out of 9
Percentage of Missing and Non-Applicable Values = 0 %

SUBTOTALS 96 150
SUBSCORE 64
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 4 Out of 25
Overall Percentage of Assumed Values = 16 %

OVERALL SCORE 64
(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

Name of Site D7 - Receiver Area Disposal Site

Location UTM Coordinates: EJ547320 3373830

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	1	12	12	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	75	138
Percentage of Assumed Values = 0 %		SUBSCORE		57
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	2	15	30	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	1	4	4	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	130	195
Percentage of Assumed Values = 22 %		SUBSCORE		67
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
[illegible]	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 70

Reason for Assigned Hazardous Rating:

PCB capacitors, PCB transformer oils, waste solvents, waste oils, insecticide containers

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and [illegible] Access to Site	0	7	0	21
Hazardous Waste Quantity	1	7	7	21
Total Waste Quantity	1	4	4	12
Waste Incompatibility	1	3	3	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	1	7	7	21

Number of Assumed Values = 2 Out of 9

Percentage of Assumed Values = 22 %

Number of Missing and Non-Applicable Values = 0 Out of 9

Percentage of Missing and Non-Applicable Values = 0 %

SUBTOTALS 79 150

SUBSCORE 53

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 4 Out of 25

Overall Percentage of Assumed Values = 16 %

OVERALL SCORE 62

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA
ASSESSMENT AND RATING FORM

Name of Site T3 - Hardstand 7

Location UTM Coordinates: EJ546180 3372820

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	4	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	0	3	0	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	61	138
Percentage of Assumed Values = 0 %		SUBSCORE		44
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	3	10	30	30
Level of Water Contamination	3	15	45	45
Type of Contamination, Soil/Biota	3	5	15	15
Distance to Nearest Surface Water	2	4	8	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 0 Out of 10		SUBTOTALS	167	195
Percentage of Assumed Values = 0 %		SUBSCORE		86
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 60

Reason for Assigned Hazardous Rating:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	1	7	7	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	3	-	-
Subsurface Flows	0	7	0	21
		SUBTOTALS	43	120
		SUBSCORE		36

Number of Assumed Values = 0 Out of 9
Percentage of Assumed Values = 0 %
Number of Missing and Non-Applicable Values = 2 Out of 9
Percentage of Missing and Non-Applicable Values = 22 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 0 Out of 25
Overall Percentage of Assumed Values = 0 %

OVERALL SCORE 59

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site D4 - Disposal Pit Near Skeet Range

Location UTM Coordinates: EJ549450 3370800

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	3	4	12	12
Distance to Nearest Drinking Water Well	2	15	30	45
Distance to Reservation Boundary	3	6	18	18
Land Use/Zoning	0	3	0	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	66	138
Percentage of Assumed Values = 0 %		SUBSCORE		48
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	111	195
Percentage of Assumed Values = 20 %		SUBSCORE		57
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 60

Reason for Assigned Hazardous Rating:

Liquid pesticides, solvents

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	3	8	24	24
Subsurface Flows	3	7	21	21
Number of Assumed Values = 0 Out of 9		SUBTOTALS	108	150
Percentage of Assumed Values = 0 %		SUBSCORE		72
Number of Missing and Non-Applicable Values = 0 Out of 9		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing and Non-Applicable Values = 0 %				

Overall Number of Assumed Values = 2 Out of 25

Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 59

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site T1 - Herbicide Test Grid

Location UTM Coordinates: EJ566370 3376035

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	2	15	30	45
Distance to Reservation Boundary	2	6	12	18
Land Use/Zoning	0	3	0	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	48	138
Percentage of Assumed Values = 0 %		SUBSCORE		35
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	3	10	30	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	3	5	15	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	2	7	14	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 0 Out of 10		SUBTOTALS	134	195
Percentage of Assumed Values = 0 %		SUBSCORE		69
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 80

Reason for Assigned Hazardous Rating:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and E of Access to Site	0	7	0	21
Hazardous Waste Quantity	1	7	7	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	3	8	24	24
Subsurface Flows	0	7	0	21
		SUBTOTALS	67	144
		SUBSCORE		47

Number of Assumed Values = 0 Out of 9
Percentage of Assumed Values = 0 %
Number of Missing and Non-Applicable Values = 1 Out of 9
Percentage of Missing and Non-Applicable Values = 11 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 0 Out of 25
Overall Percentage of Assumed Values = 0 %

OVERALL SCORE 59

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site D18 - Valparaiso - Niceville Landfill

Location UTM Coordinates: EJ547260 3379450

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	0	6	0	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	57	138
Percentage of Assumed Values = 0 %		SUBSCORE		41
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	3	10	30	30
Level of Water Contamination	3	15	45	45
Type of Contamination, Soil/Biota	2	5	10	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 0 Out of 10		SUBTOTALS	166	195
Percentage of Assumed Values = 0 %		SUBSCORE		85
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:

Operating plans indicate hazardous waste trench

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	0	7	0	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	2	4	8	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	1	7	7	21
Number of Assumed Values = 1 Out of 9		SUBTOTALS	73	150
Percentage of Assumed Values = 11 %		SUBSCORE		49
Number of Missing and Non-Applicable Values = 0 Out of 9		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing and Non-Applicable Values = 0 %				

Overall Number of Assumed Values = 1 Out of 25

Overall Percentage of Assumed Values = 4 %

OVERALL SCORE 58

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

of Site D9 - Mullet Creek Disposal Site

Location UTM Coordinates: EJ565050 3376510

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	0	6	0	18
Land Use/Zoning	2	3	6	9
Critical Environments	1	12	12	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	69	138
Percentage of Assumed Values = 0 %		SUBSCORE		50
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil Waste	1	5	5	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	3	4	0	12
Surface Erosion	2	4	8	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	119	195
Percentage of Assumed Values = 20 %		SUBSCORE		61
Number of Missing Values = 0 Out of 10		Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:

Herbicide drums, solvent drums

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
S Closure	3	8	24	24
Subsurface Flows	2	7	14	21
		SUBTOTALS	101	150
		SUBSCORE		67

Number of Assumed Values = 0 Out of 9

Percentage of Assumed Values = 0 %

Number of Missing and Non-Applicable Values = 0 Out of 9

Percentage of Missing and Non-Applicable Values = 0 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 4 Out of 25

Overall Percentage of Assumed Values = 16 %

OVERALL SCORE 57

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site S2 - DPDO Drum Storage Yard

Location UTM Coordinates: EJ548080 3371500

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	1	6	18	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	75	138
Percentage of Assumed Values = 0 %		SUBSCORE		54
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 1 Out of 10		SUBTOTALS	111	195
Percentage of Assumed Values = 10 %		SUBSCORE		57
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:

PCB, DOT drum leakage, and waste fuel spillage

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	-	2	-	-
Site Closure	-	8	-	-
Subsurface Flows	3	7	21	21
		SUBTOTALS	78	120
		SUBSCORE		65

Number of Assumed Values = 0 Out of 9

Percentage of Assumed Values = 0 %

Number of Missing and Non-Applicable Values = 2 Out of 9

Percentage of Missing and Non-Applicable Values = 22 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 1 Out of 25

Overall Percentage of Assumed Values = 4 %

OVERALL SCORE 57

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site D15 - Field No. 2 North Sanitary Landfill/Hardfill

Location UTM Coordinates: EJ55330 3383640

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	2	15	30	45
Distance to Reservation Boundary	0	6	0	18
Land Use/Zoning	2	3	6	9
Critical Environments	1	12	12	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	54	138
Percentage of Assumed Values = 0 %		SUBSCORE		39
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	2	10	20	30
Level of Water Contamination	2	15	30	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	2	6	12	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	2	4	8	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	138	135
Percentage of Assumed Values = 20 %		SUBSCORE		102
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
[illegible]	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
[illegible]0	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:
Solvents, solvent drums, herbicide drums

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	0	7	0	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	1	4	4	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Su[illegible]	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	3	8	24	24
Subsurface Flows	3	7	21	21
Number of Assumed Values = 2 Out of 9		SUBTOTALS	91	150
Percentage of Assumed Values = 22 %		SUBSCORE		61
Number of Missing and Non-Applicable Values = 0 Out of 9		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing and Non-Applicable Values = 0 %				

Overall Number of Assumed Values = 4 Out of 25

Overall Percentage of Assumed Values = 16 %

OVERALL SCORE 57

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site DS - A-19 Drum Disposal Site

Location UTM Coordinates: EJ547510 3373420

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	87	138
Percentage of Assumed Values = 0 %		SUBSCORE		63
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	111	195
Percentage of Assumed Values = 20 %		SUBSCORE		57
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 10 to 100 points based on the following guidelines:

Points	
10	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:

solvent containing drums and waste fuel oil containing drums suspected some empty drums uncovered; based on personnel interviews most drums at site have been covered

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Containing Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	NA	3	NA	NA
Site Closure	2	8	16	24
Surface Flows	0	7	0	21
Number of Assumed Values = 2 Out of 9		SUBTOTALS	73	144
Percentage of Assumed Values = 22 %		SUBSCORE		51
Number of Missing and Non-Applicable Values = 1 Out of 9		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing and Non-Applicable Values = 11 %				

Overall Number of Assumed Values = 5 Out of 25

Overall Percentage of Assumed Values = 25 %

OVERALL SCORE 55

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND ILL AREA

ASSESSMENT AND RATING FORM

Name of Site: D17 - Field No. 2, Drum Disposal Site

Location: UTM Coordinates: EJ553350 3381670

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	2	15	30	45
Distance to Reservation Boundary	2	6	12	18
Land Use/Zoning	0	3	0	9
Critical Environments	1	12	12	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	60	138
Percentage of Assumed Values = 0 %		SUBSCORE		43
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	2	4	8	12
Depth to Groundwater	1	11	11	11
Net Precipitation	1	6	18	18
Soil Permeability	1	6	18	18
Bedrock Permeability	1	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	107	195
Percentage of Assumed Values = 20 %		SUBSCORE		55
Number of Missing Values = 0 Out of 10		Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:
Cleaning solvent drums

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Containing Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Gas Collection Systems	NA	2	NA	NA
Site Closure	2	8	16	24
Subsurface Flows	3	7	21	21

Number of Assumed Values = 0 Out of 9
Percentage of Assumed Values = 0 %
Number of Missing and Non-applicable Values = 0 Out of 9
Percentage of Missing and Non-applicable Values = 0 %

SUBTOTALS 94 144
SUBSCORE 65
(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 3 Out of 25
Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 54

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site D30 - Sanitary Landfill

Location UTM Coordinates: EJ528040 3365730

Owner/Operator:

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	3	4	12	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	69	138
Percentage of Assumed Values = 0 %		SUBSCORE		50
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	2	6	12	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	97	195
Percentage of Assumed Values = 20 %		SUBSCORE		50
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 10 to 100 points based on the following guidelines:

Points	
10	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:
Waste treatment sludges, solvents, drummed materials

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	2	7	14	21
Number of Assumed Values = 0 Out of 9		SUBTOTALS	93	150
Percentage of Assumed Values = 0 %		SUBSCORE		62
Number of Missing and Non-Applicable Values = 0 Out of 9		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing and Non-Applicable Values = 0 %				

Overall Number of Assumed Values = 2 Out of 25

Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 53

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.10 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site: D29 - Sanitary Landfill

Location: UTM Coordinates: EJ528400 3365800

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	3	4	12	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	69	138
Percentage of Assumed Values = 0 %		SUBSCORE		50
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
[illegible]nce of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	2	6	12	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	3	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	97	195
Percentage of Assumed Values = 20 %		SUBSCORE		50
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:

Liquid waste pits of sludges, solvents and drummed materials (minor quantities).

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	2	7	14	21
		SUBTOTALS	93	150
		SUBSCORE		62

Number of Assumed Values = 0 Out of 9
Percentage of Assumed Values = 0 %
Number of Missing and Non-Applicable Values = 0 Out of 9
Percentage of Missing and Non-Applicable Values = 0 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 2 Out of 25
Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 53

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

Name of Site: IS4 - Welding/Electroplating

Location: UTM Coordinates: E2546700

Owner/Operator:

Comments:

RATING FACTOR				
RECEPTORS				
Population Within 1,000 Feet	3			12
Distance to Nearest Drinking Water Well	3		15	45
Distance to Reservation Boundary	3		3	9
Land Use Zoning	3		3	9
Critical Environments	3	3	3	36
Water Quality of Nearby Surface Water Body	3		3	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	63	138
Percentage of Assumed Values = 0 %		SUBSCORE		46
Number of Missing Values = 0 Out of 6		Factor Score Divided by Maximum Score and Multiplied by 100		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	2	3	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	3	3	12
Depth to Groundwater	3	3	21	21
Net Precipitation	3		13	13
Soil Permeability	3		18	18
Bedrock Permeability	3	3	12	12
Depth to Bedrock	3	3	3	12
Surface Erosion	3		3	12
Number of Assumed Values = 2 Out of 10		SUBTOTAL	103	195
Percentage of Assumed Values = 20 %		SUBSCORE		53
Number of Missing Values = 0 Out of 10		Factor Score Divided by Maximum Score and Multiplied by 100		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgmental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:

Electroplating Wastes Solutions - small quantities of Cadmium cyanide, Cadmium oxide, sodium hydroxide and sodium cyanide.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
e Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	NA	NA	NA	NA
Use of Gas Collection Systems	NA	NA	NA	NA
Site Closure	3	8	24	24
Subsurface Flows	3	7	21	21

Number of Assumed Values = 0 Out of 9

Percentage of Assumed Values = 0 %

Number of Missing and Non-Applicable Values = 2 Out of 9

Percentage of Missing and Non-Applicable Values = 22 %

SUBTOTALS 84 126

SUBSCORE 67

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 3 Out of 35

Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 54

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

of Site D37 - Wright Landfill

Location UTM Coordinates: EJ535940 3370730

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	4	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
		SUBTOTALS	37	138
Number of Assumed Values = 0 Out of 6		SUBSCORE		29
Percentage of Assumed Values = 0 %		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Number of Missing Values = 0 Out of 6				
Percentage of Missing Values = 0 %				

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
PATHWAYS				
Evidence of Water Contamination	3	10	30	30
Level of Water Contamination	3	15	45	45
Type of Contamination, Soil/Biota	2	5	10	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
[illegible] Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
		SUBTOTALS	158	195
Number of Assumed Values = 0 Out of 10		SUBSCORE		81
Percentage of Assumed Values = 0 %		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Number of Missing Values = 0 Out of 10				
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 40

Reason for Assigned Hazardous Rating:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	0	7	0	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	2	4	8	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	1	7	7	21

Number of Assumed Values = 1 Out of 9 — SUBTOTALS 71 150

Percentage of Assumed Values = 11 % — SUBSCORE 49

Number of Missing and Non-Applicable Values = 0 Out of 9 — (Factor Score Divided by Maximum Score and Multiplied by 100)

Percentage of Missing and Non-Applicable Values = 0 %

Overall Number of Assumed Values = 1 Out of 25

Overall Percentage of Assumed Values = 4 %

OVERALL SCORE 52

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site IS3 - Paint Shop, Building 127

Location UTM Coordinates: EJ546700 3371200

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	63	138
Percentage of Assumed Values = 0 %		SUBSCORE		46
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil, Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	3	7	21	21
Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	103	195
Percentage of Assumed Values = 20 %		SUBSCORE		53
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:
Dilute paint water circulation tank waste.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	NA	6	NA	NA
Use of Gas Collection Systems	NA	2	NA	NA
Site Closure	3	8	24	24
Subsurface Flows	3	7	21	21
Number of Assumed Values = 0 Out of 9		SUBTOTALS	84	126
Percentage of Assumed Values = 0 %		SUBSCORE		67
Number of Missing and Non-Applicable Values = 2 Out of 9		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing and Non-Applicable Values = 22 %				

Overall Number of Assumed Values = 3 Out of 25

Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 54

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND FILL AREA

ASSESSMENT AND RATING FORM

Name of Site S-3 - CE Storage Yard

Location UTM Coordinates: EJ548700 3371430

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	2	15	30	45
Distance to Reservation Boundary	2	6	12	18
Land Use/Zoning	0	3	0	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
		SUBTOTALS	48	138
		SUBSCORE		35

Number of Assumed Values = 0 Out of 6

Percentage of Assumed Values = 0 %

Number of Missing Values = 0 Out of 6

Percentage of Missing Values = 0 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

PATHWAYS				
Evidence of Water Contamination	2	10	20	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	2	5	10	15
Distance to Nearest Surface Water	2	4	8	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	3	4	12	12
		SUBTOTALS	134	195
		SUBSCORE		69

Number of Assumed Values = 2 Out of 10

Percentage of Assumed Values = 20 %

Number of Missing Values = 0 Out of 10

Percentage of Missing Values = 0 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:

Pesticide leakage near building

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	NA	6	NA	NA
Use of Gas Collection Systems	NA	2	NA	NA
Site Closure	-	3	-	-
Subsurface Flows	3	7	21	21

Number of Assumed Values = 0 Out of 9

Percentage of Assumed Values = 0 %

Number of Missing and Non-Applicable Values = 2 Out of 9

Percentage of Missing and Non-Applicable Values = 22 %

SUBTOTALS 60 102

SUBSCORE 59

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 2 Out of 25

Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 54

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.20 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site D31 - Landfill

Location UTM Coordinates: EJ528180 3365600

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	3	4	12	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	69	138
Percentage of Assumed Values = 0 %		SUBSCORE		50
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	2	6	12	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	97	195
Percentage of Assumed Values = 20 %		SUBSCORE		50
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 40

Reason for Assigned Hazardous Rating:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	2	7	14	21
		SUBTOTALS	93	150
		SUBSCORE		62

Number of Assumed Values = 0 Out of 9

Percentage of Assumed Values = 0 %

Number of Missing and Non-Applicable Values = 0 Out of 9

Percentage of Missing and Non-Applicable Values = 0 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 2 Out of 25

Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 31

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site: D32 - Dry Landfill

Location: UTM Coordinates: EJ529800 3365700

Owner/Operator:

Comments:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	3	4	12	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	2	12	24	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	69	138
Percentage of Assumed Values = 0 %		SUBSCORE		50
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	2	6	12	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	97	195
Percentage of Assumed Values = 20 %		SUBSCORE		50
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 40

Reason for Assigned Hazardous Rating:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	2	2	4	6
Site Closure	2	8	16	24
Subsurface Flows	2	7	14	21
		SUBTOTALS	93	150
		SUBSCORE		62

Number of Assumed Values = 2 Out of 9

Percentage of Assumed Values = 0 %

Number of Missing and Non-Applicable Values = 0 Out of 9

Percentage of Missing and Non-Applicable Values = 2 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 2 Out of 25

Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 51

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

Name of Site ISI - Missile Maintenance, Building 1285

Location UTM Coordinates: EJ544875 3373500

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	3	15	45	45
Distance to Reservation Boundary	2	6	12	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	69	138
Percentage of Assumed Values = 0 %		SUBSCORE		50
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	111	195
Percentage of Assumed Values = 20 %		SUBSCORE		57
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:

MEK, paint strippers 6 gallons/month since 1976

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	NA	6	NA	NA
Use of Gas Collection Systems	N.A.	2	N.A.	N.A.
Site Closure	3	8	24	24
Subsurface Flows	0	7	0	21

Number of Assumed Values = 0 Out of 9

Percentage of Assumed Values = 0 %

Number of Missing and Non-Applicable Values = 2 Out of 9

Percentage of Missing and Non-Applicable Values = 22 %

SUBTOTALS 63 126

SUBSCORE 50

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 3 Out of 25

Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 52

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.10 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

Name of Site IS6 - Allied Trades - Paint Booth, Building 9011

Location UTM Coordinates: EJ529140 3364800

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	2	6	12	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	39	138
Percentage of Assumed Values = 0 %		SUBSCORE		28
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	103	195
Percentage of Assumed Values = 20 %		SUBSCORE		53
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:

Minor quantities of paint spray booth liquid.

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
[illegible]e Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	NA	6	NA	NA
Use of Gas Collection Systems	NA	2	NA	NA
Site Closure	3	8	24	24
Subsurface Flows	3	7	21	21

Number of Assumed Values = 0 Out of 9 SUBTOTALS 84 126

Percentage of Assumed Values = 0 % SUBSCORE 67

Number of Missing and Non-Applicable Values = 2 Out of 9 (Factor Score Divided by Maximum Score and Multiplied by 100)

Percentage of Missing and Non-Applicable Values = 22 %

Overall Number of Assumed Values = 1 Out of 25

Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 50

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND FILL AREA

ASSESSMENT AND RATING FORM

Name of Site IS2 - Electric Shop, Building 136

Location UTM Coordinates: EJ546950 3371500

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	2	15	30	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	48	138
Percentage of Assumed Values = 0 %		SUBSCORE		35
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	1	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	96	135
Percentage of Assumed Values = 20 %		SUBSCORE		49
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 50

Reason for Assigned Hazardous Rating:
Battery acid waste

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	3	7	21	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	NA	6	NA	NA
Use of Gas Collection Systems	NA	2	NA	NA
Site Closure	3	8	24	24
Subsurface Flows	2	7	14	21

Number of Assumed Values = 0 Out of 9
Percentage of Assumed Values = 0 %
Number of Missing and Non-Applicable Values = 2 Out of 9
Percentage of Missing and Non-Applicable Values = 22 %

SUBTOTALS -- 126
SUBSCORE 61
Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 3 Out of 25
Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 49

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site D33 - Sanitary Landfill

Location UTM Coordinates: EJ529000 3366380

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	
Distance to Nearest Drinking Water Well	1	15	15	
Distance to Reservation Boundary	1	6	6	
Land Use/Zoning	2	3	6	
Critical Environments	0	12	0	
Water Quality of Nearby Surface Water Body	1	6	6	
Number of Assumed Values = 0 Out of 6		SUBTOTALS	33	138
Percentage of Assumed Values = 0 %		SUBSCORE		24
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	1	10	10	
Level of Water Contamination	1	15	15	
Type of Contamination, Soil/Biota	1	5	5	
Distance to Nearest Surface Water	1	4	4	
Depth to Groundwater	3	7	21	
Net Precipitation	3	6	18	
Soil Permeability	3	6	18	
Bedrock Permeability	3	4	12	
Depth to Bedrock	0	4	0	
Surface Erosion	0	4	0	
Number of Assumed Values = 2 Out of 10		SUBTOTALS	103	119
Percentage of Assumed Values = 20 %		SUBSCORE		87
Number of Missing Values = 0 Out of 10		Factor Score Divided by Maximum Score and Multiplied by 100		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantities of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 40

Reason for Assigned Hazardous Rating:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	2	7	14	21
		SUBTOTALS	86	150
		SUBSCORE		57

Number of Assumed Values = 1 Out of 9
Percentage of Assumed Values = 11 %
Number of Missing and Non-Applicable Values = 0 Out of 9
Percentage of Missing and Non-Applicable Values = 0 %

(Factor Score Divided by Maximum Score and Multiplied by 100)

Overall Number of Assumed Values = 1 Out of 25
Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 44

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site D35 - Landfill

Location UTM Coordinates: EJ529480 3364585

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	2	6	12	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	2	6	12	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	45	138
Percentage of Assumed Values = 0 %		SUBSCORE		33
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	2	7	14	21
Net Precipitation	3	6	18	18
Soil Permeability	2	6	12	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	90	195
Percentage of Assumed Values = 20 %		SUBSCORE		46
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 40

Reason for assigned Hazardous Rating:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	1	4	4	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	3	8	24	24
Subsurface Flows	0	7	0	21
Number of Assumed Values = 0 Out of 9		SUBTOTALS	84	150
Percentage of Assumed Values = 0 %		SUBSCORE		56
Number of Missing and Non-Applicable Values = 0 Out of 9		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing and Non-Applicable Values = 0 %				

Overall Number of Assumed Values = 2 Out of 25

Overall Percentage of Assumed Values = 8 %

OVERALL SCORE 44

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA

ASSESSMENT AND RATING FORM

Name of Site 034 - Sanitary Landfill

Location UTM Coordinates: EJ529100 336200

Owner/Operator

Comments

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
RECEPTORS				
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking Water Well	1	15	15	45
Distance to Reservation Boundary	1	6	6	18
Land Use/Zoning	2	3	6	9
Critical Environments	0	12	0	36
Water Quality of Nearby Surface Water Body	1	6	6	18
Number of Assumed Values = 0 Out of 6		SUBTOTALS	33	138
Percentage of Assumed Values = 0 %		SUBSCORE		24
Number of Missing Values = 0 Out of 6		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				
PATHWAYS				
Evidence of Water Contamination	1	10	10	30
Level of Water Contamination	1	15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Nearest Surface Water	1	4	4	12
Depth to Groundwater	3	7	21	21
Net Precipitation	3	6	18	18
Soil Permeability	3	6	18	18
Bedrock Permeability	3	4	12	12
Depth to Bedrock	0	4	0	12
Surface Erosion	0	4	0	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	103	195
Percentage of Assumed Values = 20 %		SUBSCORE		53
Number of Missing Values = 0 Out of 10		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing Values = 0 %				

WASTE CHARACTERISTICS

Hazardous Rating: Judgemental rating from 30 to 100 points based on the following guidelines:

Points	
30	Closed domestic-type landfill, old site, no known hazardous wastes
40	Closed domestic-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Known small quantities of hazardous wastes
70	Suspected moderate quantities of hazardous wastes
80	Known moderate quantites of hazardous wastes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes

SUBSCORE 40

Reason for Assigned Hazardous Rating:

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
WASTE MANAGEMENT PRACTICES				
Record Accuracy and Ease of Access to Site	2	7	14	21
Hazardous Waste Quantity	0	7	0	21
Total Waste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds	3	6	18	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
Site Closure	2	8	16	24
Subsurface Flows	2	7	14	21
Number of Assumed Values = 1 Out of 9		SUBTOTALS	86	150
Percentage of Assumed Values = 11 %		SUBSCORE		57
Number of Missing and Non-Applicable Values = 0 Out of 9		(Factor Score Divided by Maximum Score and Multiplied by 100)		
Percentage of Missing and Non-Applicable Values = 0 %				

Overall Number of Assumed Values = 3 Out of 25

Overall Percentage of Assumed Values = 12 %

OVERALL SCORE 44

(Receptors Subscore X 0.22 plus
Pathways Subscore X 0.30 plus
Waste Characteristics Subscore X 0.24 plus
Waste Management Subscore X 0.24)

APPENDIX I

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